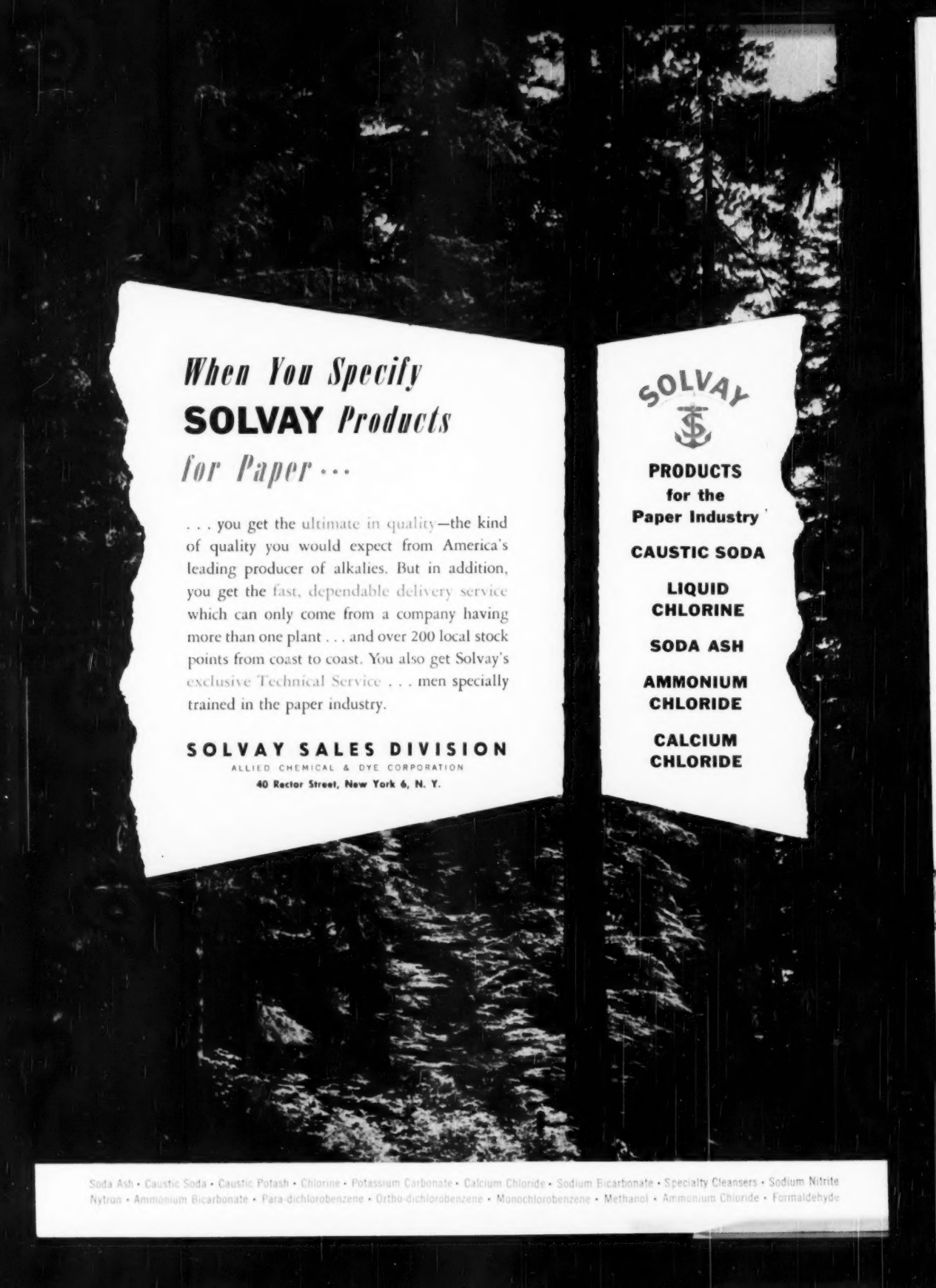
Chemical Industries

AUGUST 1950

6th Annual Survey of NEW CHEMICALS and NEW EQUIPMENT

Mound of sulfur produced from hydrogen sulfide in natural gas.

Polyethylene Gains	177	Chemical Developments	186	Survey of Specialties	213
Greases from Clay	180	Equipment Trends	198	New Chemicals for Industry	245
Tools of Progress	184	Packaging Progress	200	New Equipment Tabulation	274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Chemical Industries

Including CHEMICAL SPECIALTIES

Vol. 67, No. 2

AUGUST 1950

THE MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

What's new

Polyethylene Progress	177	Color Catcher	181
Headbox Hero	178	Nuclear Nonsense	181
Kick from Korea	179	Sodium Dust	182
Metamorphosed Clay	180	Data Detector	183

FEATURES

Tools for Progress — *by George W. Merck* 185
High Activity Marks Research and Development 186
New Process Equipment to Aid Plant Expansion 199
Containers Play Key Role in Chemical Progress 201
New Chemicals for Industry 245
New Equipment for Industry 274

CHEMICAL SPECIALTIES

Specialty Products Share Industrial Boom 213
Specialties News 232 — New Chemical Specialties 238
Trademarks 242

EVERY MONTH

The Reader Writes	158	Laboratory Equipment	312
Newsletter	171	Industry's Bookshelf	314
The Chemical Panorama	205	Booklets and Catalogs	323
New Products and Processes	292	General News	327
New Equipment	298	Chemical Markets	336
Packaging and Shipping	304	U. S. Patents	340

The Advertisers Index will be found on page 355

Chemical Industries is indexed regularly by Engineering Index, Inc., and Industrial Arts Index.

ABP ABC

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This issue is $1.00

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THE READER WRITES

Proper Allocation of Development Effort

To the Editor of Chemical Industries:

Recently I had the privilege of reading a talk given by Dr. Charles Allen Thomas of the Monsanto Chemical Co. in which he made a point which I believe is well worth passing on to anyone who has anything to do with research—whether he be in management or a member of research team. By heeding Dr. Thomas' advice I believe we could increase tremendously the effectiveness of a large amount of the industrial research carried out in this country. I quote from Dr. Thomas' paper:

"The general tendency is to be too superficial in the laboratory phases of a research project, in spite of the fact that the laboratory stage usually consumes the least money of any of the principal steps in the development of a project. It could easily be true, for example, that pilot plant research would consume five to ten times the total cost of laboratory work. The typical project is very likely to show a cost distribution pattern in which the laboratory research represents not more than a few per cent of the total expenditure for bringing a process successfully from the idea to commercial status. If an honest appraisal is made, we are quite likely to find that we have probably spent far more than all the laboratory work cost just to compensate the lack of information needed for a good design job and for construction costs which could have been avoided if a more thorough laboratory job had been done.

"It is, frankly, a little bit mysterious that the industrial research system seems to rush ahead of its information pretty consistently. It may be that the respective personalities of those in top management and those in research are so related that the former overwhelms the latter with insistence on 'speed at any price'. At best, this could only be an excuse and not a reason, for it would represent a failure on the part of scientists and technologists to sell business management on the best methods of project development."

He also goes on to point out the folly and waste of working out in great detail a process for making a product, along with cost estimates, and so forth, before enough evaluation of the end product has been done.

I believe Dr. Thomas provides some real food for thought for those of us who are interested in seeing research become an even more vital part of our industry and economy.

WILLIAM W. HECKSCHER
Baldwin, N. Y.

Epichlorohydrin Requires Careful Handling

To the Editor of Chemical Industries:

An unusual incident recently occurred involving epichlorohydrin (1-chloro-2,3-epoxypropane), a relatively new commercially available chemical.

Ten per cent by volume of epichlorohydrin was added to bromoform, the former serving both as an inhibitor and a thinner for the mixture. The two men who made and used this mixture both wore light surgeon's rubber gloves. The first man suffered burns to his fingers and hands and also irritation to his eyes and throat from fumes, although a ventilating transfer box was used in handling the materials. The epichlorohydrin vapors apparently penetrated the gloves, as is known to happen with even aqueous solutions of ethylene chlorohydrin (2-monochloro-ethyl alcohol), a similar compound. The second man apparently had exposure to the liquid mixture through a pinhole leak in his gloves, and suffered severe burns to his hands.

The following precautions should be taken:

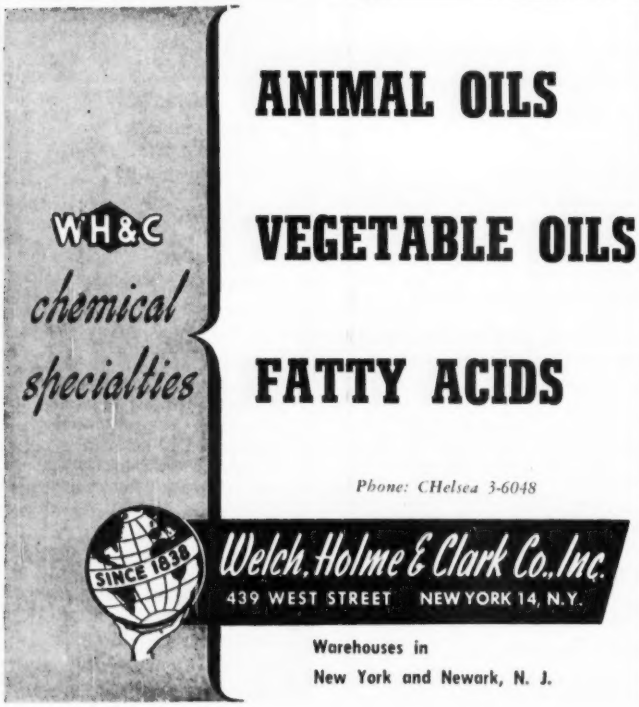
(1) Epichlorohydrin is toxic. (Although no maximum allowable concentration has yet been established for epichlorohydrin, it is worthy of note that 5 ppm has been established for ethylene chlorohydrin.) Enough ventilation should be provided so that the odor of epichlorohydrin does not persist. One study indicates 250 ppm epichlorohydrin for 4 hours kills ¾ rats.

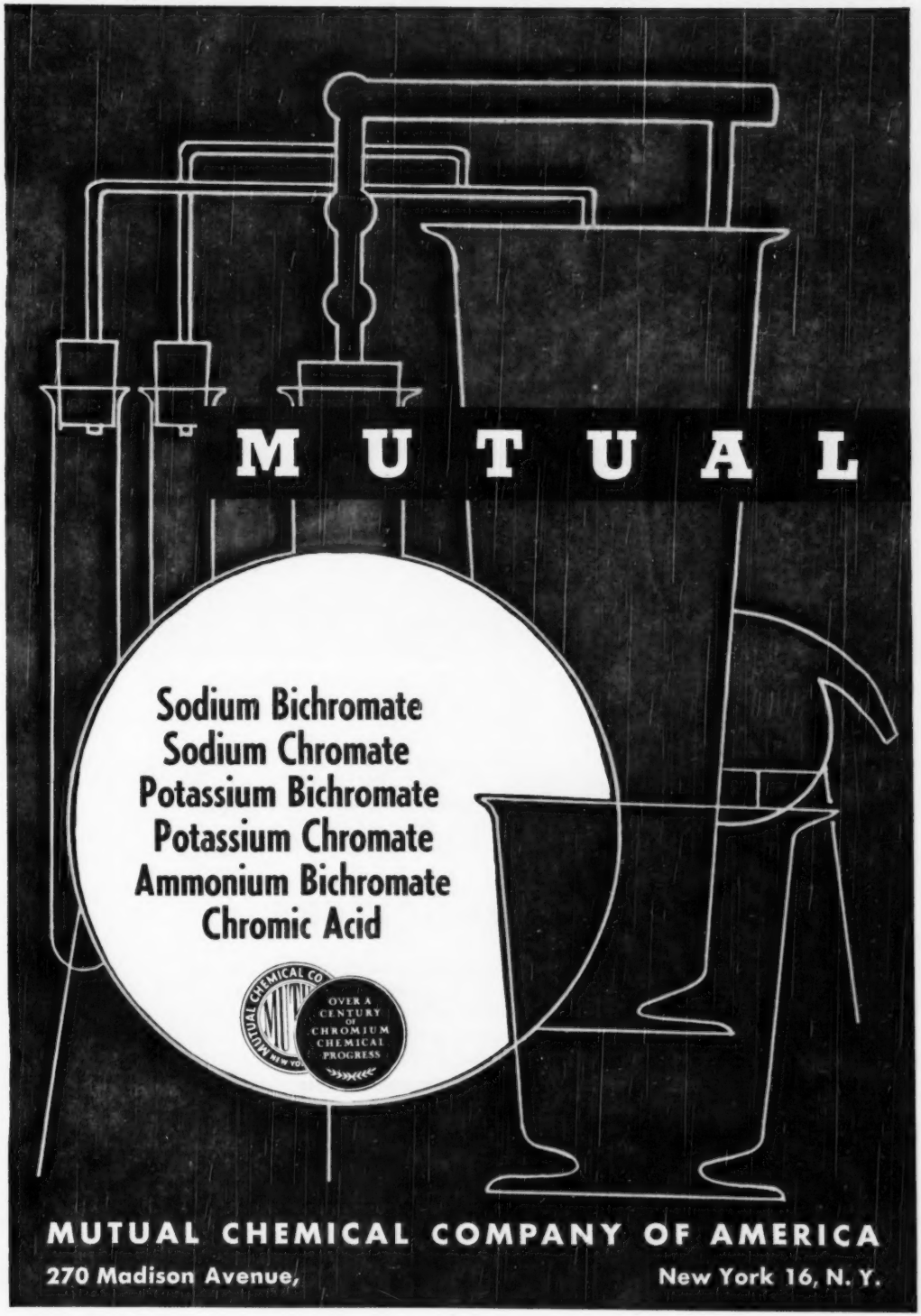
(2) The vapor irritates the eyes, nose, and throat. Eye and respiratory protection is essential.

(3) Burns may develop on the skin from exposure to the vapors as well as to the liquid. Rubber gloves are inadequate protection for extended exposure since epichlorohydrin penetrates rubber.

(4) All clothing wet with epichlorohydrin should be promptly removed and the affected area washed with soap and water.

J. E. NICHOLS
Editor, Chemical Safety
Reynolds Metals Co.
Richmond 19, Va.

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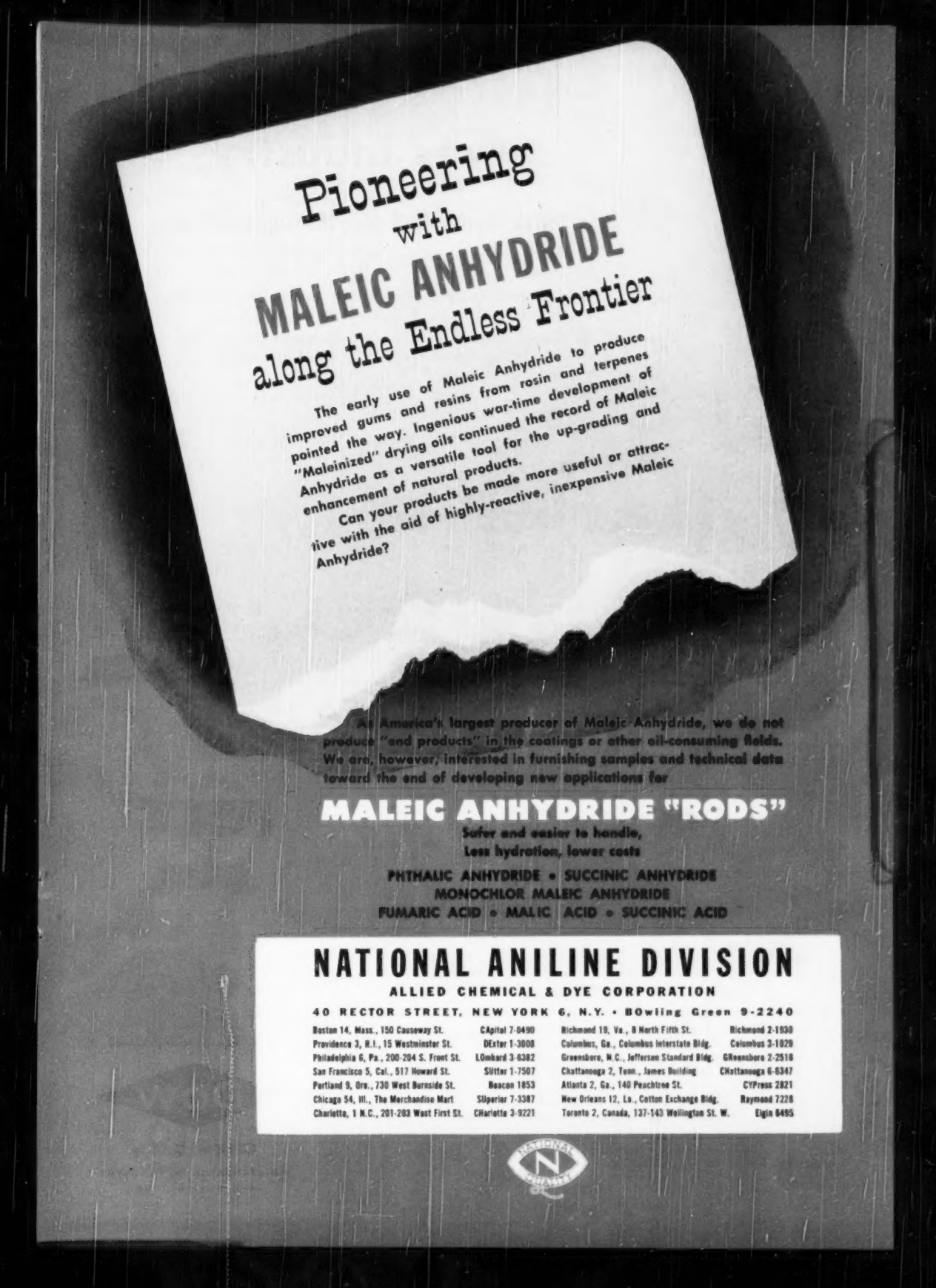
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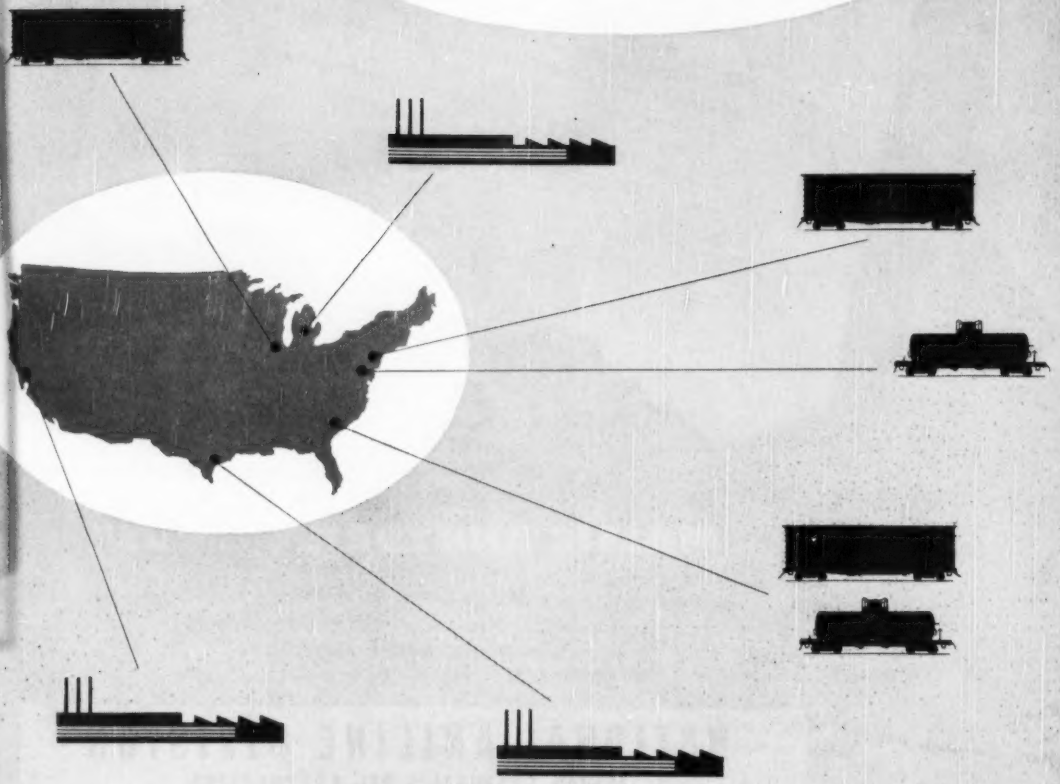

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U.S.I. CHEMICAL NEWS

August ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1950

New Lauryl Sulfate Surface Active Agent Marketed by U.S.I.

A new lauryl sulfate surface active agent is now being marketed by U.S.I. under the trade name SIPON L-20. The unusual composition of the product particularly recommends its use where high foam and detergency coupled with mild action on the skin are desired.

SIPON L-20 is the first surface active agent marketed as the result of a broad detergent development program undertaken jointly by U.S.I. and Societe Sinnova of Paris. A new production unit is nearing completion in Baltimore and additional products will be offered in the near future.

Urethan Halts Progress Of Lymphomatous Cancer

Oral administration of urethan is reported to have produced an abatement of the symptoms of mycosis fungoides, a lymphomatous cancer condition, in four of nine patients, for periods lasting from three to nineteen months. The drug was given as a 20% solution in syrup of raspberry, in doses ranging from 1 to 5 gm. per day, according to the physicians who made the treatments.

Effects on four of the patients were described as favorable and apparently significant, although temporary. Improvement consisted of relief of itching, repression of tumors, and epithelization of ulcers, the physicians state.

Eight New Antibiotics From Vegetables, Fruit

Eight new antibiotics, discovered in cabbages, sweet potatoes, and bananas are being tested for their antibacterial and antifungal potentialities. A pure crystalline antifungal agent has already been isolated, it is reported, from dried leaves of cabbage. A wilt-resistant variety of sweet potatoes is said to have yielded an extract which combats wilt-producing fungi in tomatoes. Another extract is described as active against bacteria which cause boils. Tests also indicate that extracts of chemicals produced during ripening of bananas are of a very high potency.

New Manual on Finishing And Maintaining Floors

A new manual is reported available which helps analyze specific floor problems and tells how to prepare floors for finishing, how to apply coatings, and how to maintain them. Included are sections on floors of the following types: wood (including gymnasium floors or other floors where athletic activities are held), asphalt tile, rubber tile, linoleum, concrete, cork, terrazzo, magnesite, marble, and masonite.

Stored Grains Protected By New U.S.I. Products

New Pyrenone Protectants for Use on Wheat And Other Grains and Seeds Now in Commercial Production

Culminating four years' intensive laboratory investigation including two years of extensive field trials, U.S.I. announced late in July the commercial production and availability of two new products for the protection of wheat and other stored grains and seeds against insect infestation.

This dramatic close-up shows what a weevil infestation can do to wheat. The white, dusty material is known as "Frass" — "farinaceous matter." A treatment with Pyrenone Wheat Protectant when the grain was put in storage could have prevented this damage.

Pyrenone Wheat Protectant is recommended solely for use on wheat and was developed to meet the special requirements imposed by the normal trade methods of handling and processing wheat, and uses pulverized wheat ground to a special mesh as a diluent.

Pyrenone Grain Protectant, based on a specially selected mineral diluent, has a broader field of usefulness and is recommended for use on corn, barley, rice, oats, and other grains and seeds under any conditions where the presence of a small amount of an added mineral is not objectionable.

(Laboratory and field tests demonstrated that the choice of a diluent is of vital importance in the performance of these protectants and further study may lead to the introduction of several more highly specialized protectants to meet the individual requirements imposed by certain crops.)

Insect losses in stored grains, seeds, etc., are of enormous economic consequence. Even in this country where techniques of harvesting and storage are far more advanced than in many areas, losses are estimated to range from a low of 2 or 3% under the best conditions to as high as 50% on some crops under adverse conditions. The average damage has been estimated at as high as 5% which in the U. S. alone would approximate 250,000,000 bushels or roughly $500,000,000.00

MORE

Makes Synthetic Rubber Without Use of Styrene

A new synthetic rubber called polybutadiene rubber is made from butadiene and requires no styrene, a large oil company announces. If successful the new synthetic may end the shortage of man-made rubber. Styrene, an essential ingredient in the synthetic known as "GR-S," is obtained from critically-short benzene, while butadiene, made from petroleum, can be produced in increased quantities in existing plants to meet the present heavy demand for synthetics, the announcement said.

Road tests indicate that the new synthetic is superior to GR-S and perhaps to natural rubber for tire treads. It may even be equal to "cold rubber" in quality, it is claimed. In the development process, polybutadiene latex is said to have been mixed with carbon black before conversion to solid rubber. A softer polybutadiene reportedly was obtained under moderately low temperatures.

Prevent Corrosion of Iron And Steel with Tungsten, Molybdenum Compounds

Corrosion of iron and steel by circulating water can be almost completely prevented, university scientists report, by addition of small amounts of tungsten and molybdenum compounds. Dissolving a few hundred p.p.m. of the compounds in circulating water or brine will stop rusting, it is claimed.

The compounds, sodium and potassium tungstate and sodium and potassium molybdenate, are at present more expensive than the chromates but have the advantage of being colorless, whereas the chromates are a vivid yellow. Their colorless properties suggest possible use of the compounds in such products as anti-corrosive paints.

Publishes New Free Guide To Photometric Analysis

A new manual on photometric methods of analysis has been published by a large laboratory equipment manufacturer with the aim of: (1) clarifying symbols and terminology (2) discussing range and accuracy of different methods (3) enabling the analyst to choose the operating conditions, filters, etc., best suited to the particular need.

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August ★ **U.S.I. CHEMICAL NEWS** ★ 1950

CONTINUED

Stored Grain

Up to the present these losses have only been held in check to a degree by the slow improvement of storage facilities and techniques and by more or less frequent fumiga-

Georgia Snap Corn with husk removed to show weevil damage. 90% of the nutrient value of this corn has been destroyed by the insect infestation, making it unfit for use as animal feed.

tion to keep the degree of insect infestation from getting completely out of hand.

Pyrenone Protectants, which can and should be mixed with the grain at the time of storage and before serious infestation has had an opportunity to develop, will protect the grains for a full storage season and quite possibly longer. Full tests on commercial quantities of grain treated and stored under normal commercial conditions have included wheat, corn, barley, rice, and oats, while tests now under way extend the investigation to numerous other crops.

Present economic losses include not only shrinkage (loss in weight due to insect damage) but down-grading of grains due to excessive insect infestation. An additional factor of increasing importance is the highly undesirable presence of insect fragments in flours and meals.

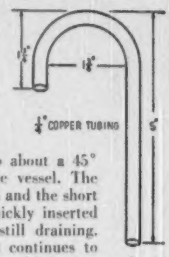
The protection of stored grains against infestation by the direct addition of a protectant material was rendered possible only by the unique combination of qualities possessed by the Pyrenones, namely, effectiveness against virtually all the common grain-destroying insects plus a practically complete freedom from toxicological hazards of any kind. Years of experimental work, which still continues intensively and will for a long time to come, have been required to arrive at the most effective formulations. The net result is the development of these completely new products and techniques which represent an enormous contribution toward the solution of one of the world's worst insect control problems.

Both availability and distribution will be limited in 1950. Pyrenone Wheat Protectant will be available in reasonable quantities for use in Kansas-Oklahoma areas, generally regarded as most serious from the standpoint of insect infestation, and in the Pacific Northwest. Pyrenone Grain Protectant during 1950 will be used mostly on Southern corn wherein infestation and consequent losses are terrifically severe. Ample quantities of both, however, will be available for commercial experiments in other areas and on other crops.

Plans for availability in 1951 are much more extensive and involve manufacture of the Pyrenone Protectants at numerous points selected to best serve areas of larger use. Major production activities will be concentrated in Kansas but supplemental plants in other large consuming areas are being built.

Good to the Last Drip

A pharmaceutical manufacturer reports that use of a handy, easy-to-make gadget for draining drums, particularly those containing expensive tax-paid alcohol, helps him to get more complete recovery of contents. The gadget is a siphon tube made from an eight-inch length of ¼-inch copper tubing. In operation, the small bung in the end of the drum is loosened but not removed and then the drum is tilted to about a 45° angle over a suitable vessel. The bung is then removed and the short leg of the siphon quickly inserted while the liquid is still draining. The siphon fills and continues to run until the last spoonful is recovered.



TECHNICAL DEVELOPMENTS

Further information regarding the manufacturers of these items may be obtained by writing U.S.I.

For removing rust stains on fabrics, a new formulation containing hydrofluoric acid is described as fast-acting and harmless to fabric. **(No. 589)**

To make aluminum as tough as heavier steel alloys, a new hard coating is applied electrochemically in thicknesses from 0.0001 to 0.006 inches, it is claimed. It is wear-resistant and insulates the metal against heat, the makers state. **(No. 590)**

To dispel unwanted odors, a new four watt lamp bulb, operating on household current, gives off just barely noticeable concentrations of ozone and has a mild germicidal effect, according to the makers. **(No. 591)**

A new plastic, claimed to bridge the gap between soft and hard rubber, meets the need for a high-strength material resistant to abrasion and chemicals and capable of production in varying degrees of flexibility. **(No. 592)**

A new, non-toxic wax activator, reported to be an efficient spreading agent for paraffin and microcrystalline waxes, plasticizes paraffin wax and greatly improves penetration of wax into porous materials such as paper and textiles, the makers assert. **(No. 593)**

Two new rust inhibitive white lead pigments, reportedly non-reactive toward vehicles containing free carboxyl groups, are available in commercial quantities. **(No. 594)**

A new caution-label dispenser for marking hazardous chemicals has three different rolls of cellulose tape labeled "corrosive," "poison," and "flammable," each in a different color, it is reported. **(No. 595)**

For quick determination of moisture content of wood and plaster, a new portable instrument is said to indicate per cent moisture direct, at the touch of a button. **(No. 596)**

To fill drums to correct weight, an extremely accurate, automatic, air-operated device is claimed to handle oils, paints, varnishes, chemicals, syrups, and food products. Unit is said to operate rapidly, and flow can be regulated to suit material and operation. Device operates safely under hazardous conditions and one man, unskilled, can handle two units, it is reported. **(No. 597)**

For instant measurement of films such as porcelain enamels, platings, leathers, paints, foils, plastic sheeting, glass, paper, rubber, lacquers, tinnings, etc., a new light-weight, vest-pocket size dry film thickness gauge is claimed to have an accuracy of ± 5% ± 0.0001 inch. **(No. 598)**

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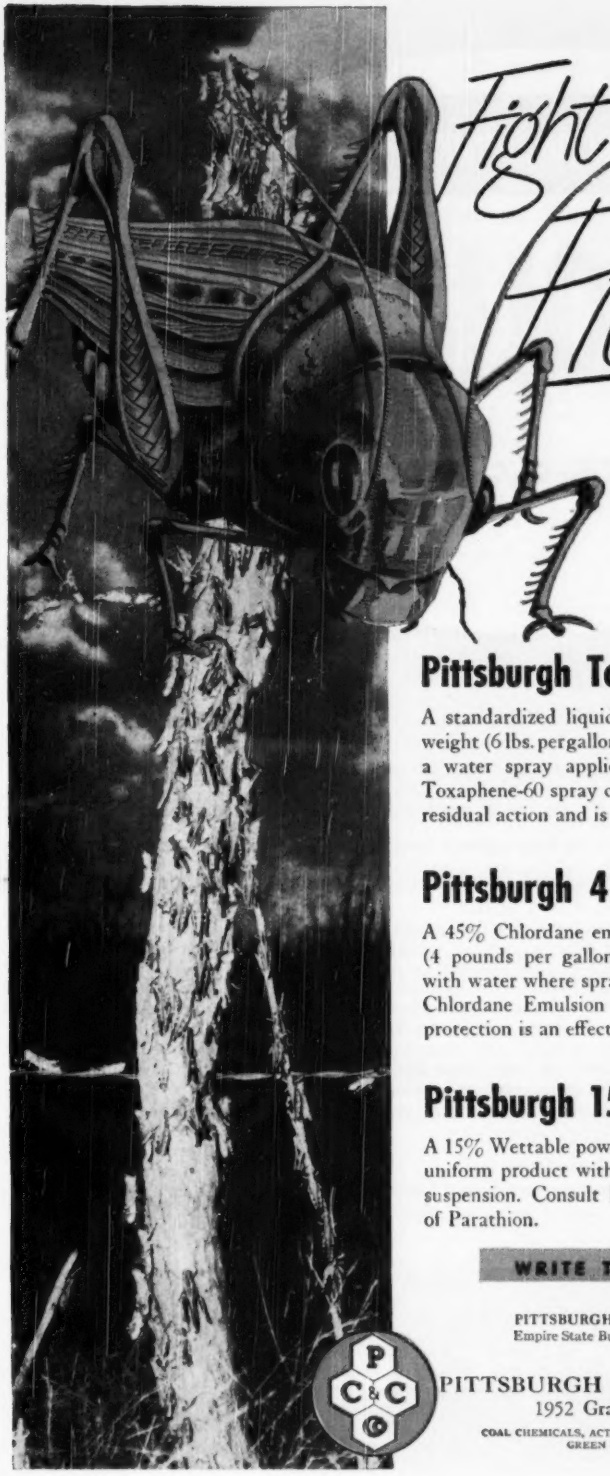
ACETIC ESTERS
Amyl Acetate—Commercial and High Test
Butyl Acetate
Ethyl Acetate—all grades
Normal-Propyl Acetate
OXALIC ESTERS
Dibutyl Oxalate
Diethyl Oxalate
PHTHALIC ESTERS
Diamyl Phthalate
Dibutyl Phthalate
Diethyl Phthalate
Diisooctyl Phthalate
OTHER ESTERS
Diatol*
Diethyl Carbonate
Ethyl Chloroformate
INTERMEDIATES
Acetoacetanilide
Acetoacet-ortho-chloroanilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloroanilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate
ETHERS
Ethyl Ether, U.S.P.
Ethyl Ether, Absolute—A.C.S.
ACETONE — A.C.S.
FEED PRODUCTS
Choline Concentrates
Curbay B-G*
D, L-Methionine
Riboflavin Concentrates
Special Liquid Curbay*
U.S.I. Animal Protein Factor Supplement
Vacatone* 40
RESINS (Synthetic and Natural)
Arochem*—modified types
Arofene*—pure phenolics
Aroflat—for special flat finishes
Aroplax*—alkyds and allied materials
Congo Gums—raw, fused & esterified
Ester Gums—all types
Natural Resins—all standard grades
INSECTICIDE MATERIALS
CPR Concentrates: Liquid & Dust
Piperonyl Butoxide
Piperonyl Cyclonene
Pyrenone* Concentrates: Liquid & Dust
Pyrethrum Products: Liquid & Dust
Rotenone Products: Liquid & Dust
INSECTIFUGE MATERIALS
Indalone*
Triple-Mix Repellents
OTHER PRODUCTS
Collodions
Ethylene
Nitrocellulose Solutions
Pib*—Liquid Insulation
Urethan, U.S.P.
Special Chemicals and Solvents

*Reg. U.S. Pat. Off.

U.S.I INDUSTRIAL CHEMICALS, INC.

60 EAST 42ND ST., NEW YORK 17, N. Y. U.S.I. BRANCHES IN ALL PRINCIPAL CITIES



Fight him these 3 Pittsburgh ways!

Pittsburgh Toxaphene-60

A standardized liquid emulsifiable concentrate containing 60% by weight (6 lbs. per gallon) Toxaphene, specifically designed for use where a water spray application is adaptable and practical. *Pittsburgh* Toxaphene-60 spray concentrate possesses the advantages of marked residual action and is effective on a wide range of insects.

Pittsburgh 45% Chlordane

A 45% Chlordane emulsion concentrate containing 45% by weight (4 pounds per gallon) Chlordane, prepared especially for dilution with water where spraying applications are required. *Pittsburgh* 45% Chlordane Emulsion Concentrate with its residual action for long protection is an effective control for many insects.

Pittsburgh 15% Parathion

A 15% Wettable powder formulated under scientific control to give a uniform product with the ability to quickly disperse and remain in suspension. Consult local agricultural authorities concerning usage of Parathion.

WRITE TODAY FOR BULLETIN IP31

PITTSBURGH AGRICULTURAL CHEMICAL COMPANY
Empire State Building • 350 Fifth Avenue • New York 1, New York

Division of
PITTSBURGH COKE & CHEMICAL COMPANY
1952 Grant Building · Pittsburgh 19, Pa.

COAL CHEMICALS, ACTIVATED CARBON, NEVILLE COKE, EMERALD COAL, PIG IRON, GREEN BAG CEMENT, CONCRETE PIPE AND PRODUCTS

Du Pont POLYCHEMICALS Department makes

DIGLYCOLIC ACID

$HOOC-CH_2-O-CH_2-COOH$

Diglycolic Acid

Description: Diglycolic Acid is a white crystalline solid that melts at 148°C. (289.4°F.). At 25°C. its ionization constants are:

$K_1 = 1.1 \times 10^{-3}$ $K_2 = 3.7 \times 10^{-5}$

The chemical properties of Diglycolic Acid are typical of a dibasic acid.

Possible Applications: The properties of Diglycolic Acid suggest many possible applications. Among these are: a masking agent for chrome liquors in leather tanning; in cleaning compounds for cooling systems; in low-pressure laminating resins of the unsaturated ester type; metal cleaning and pickling compositions; printing inks; textile finishes; as a cross linking agent for resins; in acid dye baths for textiles and in buffers (as the monosodium salt) for pH control.

Profit by the broad experience of Polychemicals' representatives to help answer your questions about Diglycolic Acid and other chemicals made by this department

Perhaps you're faced with a problem Diglycolic Acid can solve. A reliable source of up-to-date information on this chemical—and more than 100 others—is Du Pont Polychemicals Department. Because this department serves so many industries, your Polychemicals representative is familiar with a variety of chemical processes and is in a position to give you valuable technical assistance.

Many possible uses

The interesting properties of Diglycolic Acid suggest many possible applications. Its esters are efficient plasticizers that have good compatibility with a variety of resin types, such as polyvinyl chloride, nitrocellulose, ethyl cellulose and cellulose acetobutyrate. Alkyd resins of high quality, good color and good heat stability can be made by using Diglycolic Acid as a partial replacement for phthalic anhydride. The fact that it is a solid, the degree of its acidity, the buffering action of its monosodium salt suggest a considerable variety of uses, such as are illustrated in the panel at the left.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

Polychemicals

AND MORE THAN 100 INDUSTRIAL CHEMICALS

TECHNICAL BULLETINS AVAILABLE NOW on All Chemicals Listed Here for the Many Industrial Fields Served by the Polychemicals Department

It is quite possible that many of your questions about Du Pont Diglycolic Acid and other Polychemicals' products are answered in technical data available. Or your Du Pont Polychemicals representative can help you get the answers through our Sales Development facilities. You can contact him through your nearest district office—350 Fifth Avenue, New York 1, N. Y.; 818 Olive Street, St. Louis 1, Missouri; 7 S. Dearborn Street, Chicago 3, Illinois; 140 Federal Street, Boston 10, Mass.; 845 E. 60th St., Los Angeles, Calif.

For technical information bulletins, write your nearest district office.

Is YOURS one of the many industries in which Polychemicals' products are used?*

ADHESIVES "Alathon" Polythene Resins • "Arboneeld" Urea-Formaldehyde Compositions • Du Pont Crystal Urea • "Hypalon" Synthetic Resins • Methanol

AUTOMOTIVE "Dehydrol-O" Denaturant • Methanol • 3,5,5-Trimethylhexanol • "Zerone" and "Zerex" Anti-Freezes

DETERGENTS Du Pont Crystal Urea • "Lorol" Fatty Alcohols • "National" Aqua Ammonia

DRUGS & COSMETICS Du Pont Crystal Urea • Dimethyl Sulfate • Methanol • Methyl Formate • "National" Anhydrous Ammonia • "National" Aqua Ammonia • "Lorol" Fatty Alcohols

DYES, COLORS, PIGMENTS Dimethyl Sulfate • Du Pont Crystal Urea • "Lorol" Fatty Alcohols • "National" Anhydrous Ammonia • "National" Aqua Ammonia

FINISHES Adipic Acid • "Arboneeld" Urea-Formaldehyde Compositions • Du Pont Crystal Urea • "Hypalon" Synthetic Resins • "Hytrol" Solvents • Methanol • n-Propanol • Nylon-Type 8

FOOD "Mycoban" Mold and Rope Inhibitor • "National" Anhydrous Ammonia • "National" Aqua Ammonia

INKS "Alathon" Polythene Resins • Dimethyl Sulfate • Du Pont Crystal Urea • Formamide • "Hylene" Plasticizers • "Hypalon" Synthetic Resins • "Hytrol" Solvents • Methanol • "Opalwax" Synthetic Wax • 3,5,5-Trimethylhexanol

LEATHER Hydroxyacetic Acid • "Hypalon" Synthetic Resins • "Lorol" Fatty Alcohols

MACHINERY "National" Anhydrous Ammonia • "Opalwax" Synthetic Wax

METALS Hydroxyacetic Acid • Methanol • "National" Anhydrous Ammonia

PAPER Adipic Acid • "Alathon" Polythene Resins • "Arboneeld" Urea-Formaldehyde Compositions • Du Pont Crystal Urea • Hydroxyacetic Acid • "Lorol" Fatty Alcohols • "Mycoban" Sodium and Calcium Propionate • "National" Anhydrous Ammonia • "National" Aqua Ammonia • Nylon-Type 8

PETROLEUM Diglycolic Acid • Du Pont Crystal Urea • Hydroxyacetic Acid • "Lorol" Fatty Alcohols • Methanol • "National" Anhydrous Ammonia • "National" Aqua Ammonia

PLASTICS Adipic Acid • "Arboneeld" Urea-Formaldehyde Compositions • Du Pont Crystal Urea • "Hexalin" Cyclohexanol • "Hylene" Plasticizers • "Hypalon" Synthetic Resins • Methanol • Nylon-Type 8 • Propionic Acid • 3,5,5-Trimethylhexanol • "Teflon" Tetrafluoroethylene Resin • Nylon Molding Powders • Polythene • "Lucite" Acrylic Resin

RUBBER Du Pont Crystal Urea • "Hypalon" Synthetic Resins • "Lorol" Fatty Alcohols • Nylon-Type 8 • "Opalwax" Synthetic Wax • 3,5,5-Trimethylhexanol

TEXTILES Adipic Acid • "Alathon" Polythene Resins • "Arboneeld" Urea-Formaldehyde Compositions • Du Pont Crystal Urea • Hydroxyacetic Acid • "Hypalon" Synthetic Resins • "Lorol" Fatty Alcohols • Methanol • "National" Aqua Ammonia • Nylon-Type 8 • "Tyze" Resin Textile Size

WOOD "Arboneeld" Urea-Formaldehyde Compositions • Du Pont Crystal Urea

**This is only a partial listing of the Polychemicals Department products which have applications in the industries shown here.*

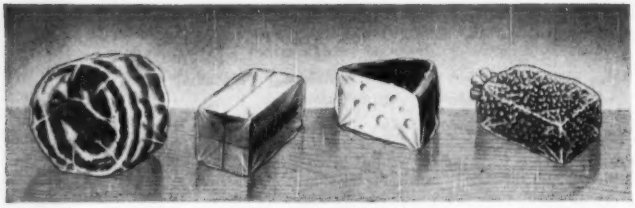
Department

E. I. DU PONT DE NEMOURS & CO. (INC.), WILMINGTON 98, DELAWARE

For Your Information

Every month Monsanto publishes these pages of pertinent information, selected to help you improve your products, lower your production costs, increase your sales.

SANTICIZER 141 MAKES VINYL FILMS SAFE FOR PACKAGING VARIOUS FOODS



Acceptance of Santicizer* 141 by the Meat Inspection Division of the Bureau of Animal Industry, U. S. Department of Agriculture, as a nontoxic plasticizer for use in plastic products which may come in contact with meat, opens the way for the production of vinyl films that will bring improved packaging to margarine, meat, cheese, cranberries and numerous other food products.

In addition, the approval is assurance of the nontoxicity of Santicizer 141 in *any* application where such quality is desirable. Other qualities delivered by Santicizer 141 include: 1. Flame resistance. 2. Softness and drape. 3. Resistance to weather. 4. Low-temperature flexibility. 5. Light stability. 6. Low volatility. 7. Resistance to embrittlement. 8. Strength, elasticity and abrasion resistance. In many cases, Santicizer 141 improves processing.

Emulsifiers step up efficiency of sprays

Insecticides, fungicides and herbicides can be used more efficiently, with economy and a minimum of effort, through the use of Monsanto emulsifiers and wetting agents.

Most toxicants used in formulations of herbicides, insecticides and mothicides cannot be dissolved in water. The practice is to concentrate these toxicants in oil or an organic solvent and to use relatively small amounts of the formulations in water for spraying. Adding Monsanto emulsifiers and wetting agents to the formulations results in excellent emulsions that spread more evenly and have better adherence. If you are a formulator, mail the coupon for a free copy of Technical Bulletin No. P-142.

Research Chemists' Corner

You may find something new here

If you are interested in new chemical discoveries, have a look at the specifications of Methyl-para-Toluenesulfonate. The specifications may suggest research that will lead you to the development of a new chemical product . . . or the improvement of an existing product. If you want further information or a sample, mail the coupon.

Methyl-para-Toluenesulfonate

Structural Formula:

Molecular Weight: 186.22

Properties:

Crystallizing Point:	Approx. 25° C.
Color:	Approx. 100 APHA
Chlorine:	0.01% Max.
Acidity as TSA:	0.01% Max.
Saponification Value	186.0 — 187.5
Sp. Gr. at 25/25° C. (super-cooled liquid)	1.225 — 1.227

Suggested Uses: Dye intermediate, alkylating agent, catalyst for alkyd and other organic ester preparations, photographic chemicals, and pharmaceutical intermediate.

Santomerse No. 1, all-purpose detergent and wetting agent, available in three densities

Extensively used as an ingredient in industrial cleaning compounds and as a wetting agent and surface-active agent, Monsanto Santomerse* No. 1 now is available in three densities. These include a granular Santomerse No. 1, designed especially for easy mechanical blending.

Santomerse No. 1, which contains a minimum of 40% active material, does a thorough job of cleaning. It lifts out particles of grease and grime and holds them in suspension so that they cannot be redeposited. Santomerse No. 1 rinses out easily and thoroughly. It is effective in hard or soft, hot or cold water and in acid, neutral or alkaline solutions. It has been found effective in temperatures ranging from below zero to above the boiling point.

For additional information on Santomerse No. 1, mail the coupon or contact the nearest Monsanto Sales Office.

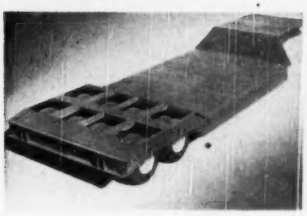
HB-40 cuts plasticizer cost in clear vinyl film

Monsanto HB-40 (partially hydrogenated terphenyl) is practically water-white, making it attractive for plasticizing vinyl films that are transparent or which are to be brilliantly colored. Since HB-40 is extremely low in cost and since it can replace substantial amounts of the primary plasticizer, it can be used to reduce production costs. This savings in costs can be attained without a reduction in quality.

HB-40 is low in toxicity, gives a dry "hand," increases tensile strength, has excellent electrical properties and is highly resistant to moisture. It is nonmigratory.

HB-40 gives excellent results in extrusions, organosols and vinyl injection moldings as well as in films. For further information, mail the coupon or contact the nearest Monsanto Sales Office.

Penta protects deck of 54-ton trailer



The deck of this 54-ton, drop-frame trailer has to be strong . . . and stay strong. That's why its manufacturer, La Crosse Trailer Corporation, La Crosse, Wisconsin, protected the 2½" oak decking with a formulation of Monsanto Penta (pentachlorophenol). Penta protection is a clean treatment that guards wood against termites and other wood-boring insects . . . against the attack of fungi that cause wood decay. Penta can be applied by brushing, dipping or pressure methods. It is a chemically stable treatment that cannot be washed away by rain or ground water. Properly formulated penta treatment leaves wood paintable. If you have a problem of wood preservation, it will pay you to investigate Monsanto Penta. For further information, mail the coupon or contact the nearest Monsanto Sales Office.

Mold in soap wrappers stopped by Santobrite

For as many years as manufacturers have been wrapping bar soaps, they have been plagued by the action of fungi in their wrapping papers. The use of as little as 2.0% (on weight of casein in size) of Santobrite* (sodium pentachlorophenate, technical) controls these microorganisms in casein-coated papers. The addition of Santobrite in the paper stock and in the glues used for sealing also is recommended.

Investigate the possibilities of Santobrite as a means of solving your problems of mold in soap wrappers. For further information, mail the coupon or contact the nearest Monsanto Sales Office.

FOR YOUR LIBRARY

Timely Monsanto publications, listed below, will be sent to users of chemicals on request . . . free and without obligation. Indicate the literature you want on the coupon.

* * *

Technical Bulletin No. O-33—Contains information on Santolube* 31, an additive for use in hydraulic oils, rust preventives, cutting oils, stationary engine lubricants and others.

* * *

Technical Bulletin No. O-52 — Describes Niran,* Monsanto's parathion, an agricultural insecticidal chemical.

* * *

Technical Bulletin No. O-62—Giving information on Santolene* C, a newly developed metal corrosion inhibitor for light petroleum products.

* * *

Technical Bulletin No. P-133—Gives data on Sterox* SE and Sterox SK, 100% active, liquid, nonionic-type, surface-active agents, wetting agents, emulsifiers and detergents.

* * *

Technical Bulletin No. P-129—Presents technical data on Sterox CD, a nonionic-type, liquid, 100% active emulsifier, detergent, surface-active agent.

* * *

Technical Bulletin No. O-16—Featuring Santomask* II for "after-odor" control of paint, printing ink and other compositions.

* * *

Technical Bulletin No. O-D-601—Data on OS-16, flame-resistant hydraulic fluid.

* * *

Technical Bulletin No. P-146—Describing the use of Santomerse S for metal processing in acid media.

* * *

Technical Bulletin No. P-101—Featuring SA-326, an antioxidant for soaps.

New furnace steps up phosphorus production

A new electric furnace, world's largest, is being built by Monsanto Chemical Company at Monsanto, Tennessee, where the company produces phosphorus of better than 99.9% purity. Monsanto converts phosphorus into phosphoric acid and various phosphates.

Here's a new service for the food industry

A new laboratory to study the application of chemicals in foods has been set up by Monsanto at Anniston, Alabama, and is ready to work on such problems for the food industry. There is no charge for investigational work by the laboratory, one of the few such establishments in the chemical industry.

The illustration shows Dr. Roy E. Morse, food technologist, conducting an experiment in tomato canning. For further information, mail the coupon.

*Reg. U. S. Pat. Off.

MONSANTO CHEMICAL COMPANY, 1703-H South Second Street, St. Louis 4, Missouri. District Sales Offices: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

MONSANTO
CHEMICALS for PLASTICS

SERVING INDUSTRY... WHICH SERVES MANKIND

INFORMATION: ☐ Santicizer 141. ☐ Santomerse No. 1. ☐ HB-40. ☐ Penta. ☐ Santobrite. ☐ Food Laboratory.

LITERATURE: ☐ Bulletin P-142 (Emulsifiers). ☐ Bulletin O-33 (Santolube 31). ☐ Bulletin O-52 (Niran). ☐ Bulletin O-62 (Santolene C). ☐ Bulletin P-133 (Sterox SE & SK). ☐ Bulletin P-129 (Sterox CD). ☐ Bulletin O-16 (Santomask II). ☐ Bulletin P-146 (Santomerse S). ☐ Bulletin P-101 (SA-326). ☐ Bulletin O-D-601.

SAMPLE: ☐ Methyl-para-Toluenesulfonate.

MONSANTO CHEMICAL COMPANY
1703-H South Second Street
St. Louis 4, Missouri

Please send information indicated at the left.

Name.....Title.....

Company.....

Street.....

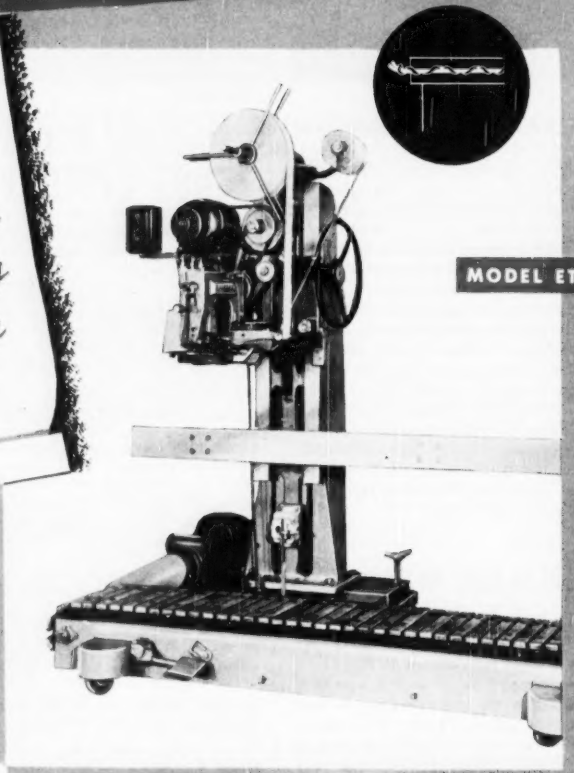
City.....Zone.....State.....

Memo to:

PRODUCTION MANAGERS
PLANT SUPERVISORS
PACKAGING ENGINEERS
PURCHASING AGENTS

You'll be glad for a long time to come when you choose your next bag closing machine from the Bagpak line!

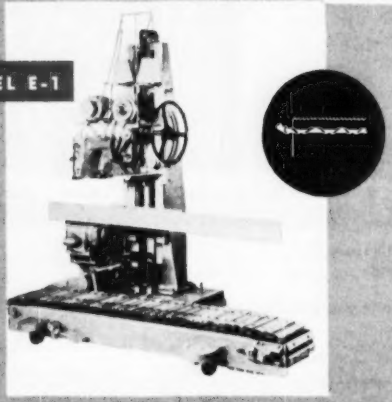
Your Choice for



MODEL ET

Applies a sewn-thru "Dry Tape" for better protection at lower cost. Tape covers the bag end — famous "Cushion Stitch" goes thru both tape and bag for stronger, tighter, yet easy-to-open closures. Closes textile bags as well as multiwalls. Semi-automatic, self-contained, easy to operate, FAST (up to 15 per minute), portable, welded steel construction and clean-cut design for trouble-free operation. Dimensional drawings and detail information available in Booklet ET. Write for your copy today.

MODEL E-1



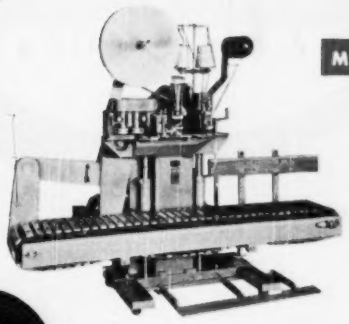
. . . essentially the same as the ET except that it applies the famous "Cushion Stitch" only. For use where tape is not necessary.

Bag Closing Efficiency

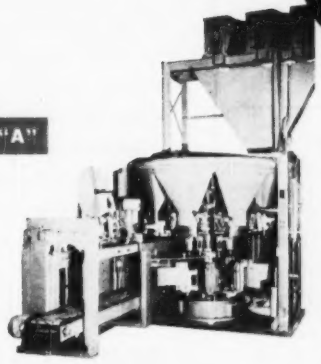
The BAGPAKER®

A big machine for a big job, the Model "A" handles 25 to 45 tons per hour! It takes only one man to operate, will fill fifteen 100-lb. bags per minute, and pays for itself in 1 to 3 years—just out of labor and material savings! Takes free- or semi-free-flowing materials and does a fully automatic job of weighing, filling, settling, sewing and sealing. Accurate weighing eliminates overweights. Filling procedure reduces bag costs. Sturdy construction insures long, trouble-free life. A letter from you brings full details.

MODEL DA



MODEL "A"



Do you package a high-priced material?—or one that needs the best protection? The Bagpak DA Machine applies a *sealing* tape *after* the bag has been sewn. The tape covers the famous "Cushion Stitch" so that even the needle holes are sealed tight! Stops sifting, resists moisture, prevents contamination and infestation!

The sewing head and tape mechanism are completely automatic, and are activated by the bag itself. Automatic tape cut-off prevents waste of tape. Portable, highly efficient and solidly built for hard, continuous usage. Full details and dimensional drawings available on request. Ask for "DA" Details.

Write today!

BAGPAK MULTIWALL BAGS

International Paper Company

BAGPAK DIVISION

220 East 42nd St., New York 17

BAG PACKAGING MACHINES

BRANCH OFFICES: Atlanta • Baltimore • Baxter Springs, Kansas • Boston • Chicago • Cleveland • Denver • Los Angeles • New Orleans • Philadelphia • Pittsburgh • St. Louis • San Francisco

IN CANADA: The Continental Paper Products, Ltd., Montreal, Ottawa

n-HEXANOL

2-ETHYLBUTANOL

METHYL AMYL ALCOHOL
(Methyl Isobutyl Carbinol)

- **6-Carbon Alcohols**
- **Available in Tank Car Quantities from CARBIDE**

SPECIFICATIONS

	n-Hexanol	2-Ethylbutanol	Methyl Amyl Alcohol (Methyl Isobutyl Carbinol)
Specific Gravity, 20/20°C.	0.819 to 0.823	0.830 to 0.834	0.806 to 0.809
Distillation, 760 mm.	I bp 153°C., min.	140°C., min.	130.0°C., min.
	Dp 160°C., max.	152°C., max.	133°C., max.
Acidity, as acetic acid	0.01% by wt., max.	0.02% by wt., max.	0.005% by wt., max.
Color	15 Pt-Co, max.	10 Pt-Co, max.	10 Pt-Co, max.

Use these high-boiling alcohols as:

Extractants

Solvents in surface coatings and printing inks

Masking agents

Frothers in ore flotation

OR as intermediates for:

Surface active agents and detergents

Ore flotation reagents

Synthetic ester lubricants

Plasticizers

Lubricant additives

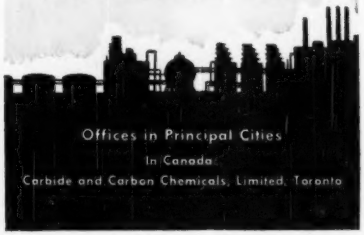
For Additional Information

Call or write the nearest CARBIDE office. Ask for a copy of the "Alcohols" booklet (F-4731), which gives helpful data on n-Hexanol, 2-Ethylbutanol, and Methyl Amyl Alcohol, as well as other CARBIDE alcohols.

CARBIDE AND CARBON CHEMICALS DIVISION

Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.



Offices in Principal Cities

In Canada:

Carbide and Carbon Chemicals, Limited, Toronto

Chemical Industries

THE MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

Newsletter,
August, 1950

For Your Information:

Carbide and Carbon Chemicals Division has entered into a contract to supply Du Pont with substantial quantities of acrylonitrile for expansion of Orlon fiber output. Based on ethylene oxide and hydrogen cyanide, the acrylonitrile will be produced at Institute, W. Va., starting about September 1951. A large share of the output, of course, will be used by Carbide itself for Dynel, its acrylonitrile-containing synthetic fiber.

Rumors that petroleum benzene producers are planning to stop making synthetic benzene are vigorously denied. One producer put it: "We're in the benzene business until a government directive forces us to channel production into toluene or aviation fuel."

* * CI * *

Strikes affecting Solvay Process Division and, more recently, Diamond Alkali Co. have shut down over 60% of soda ash capacity. Demand is high, and a shortage of serious proportions is developing. Full-capacity production of natural soda ash and substitution by some users of costlier but relatively plentiful caustic soda has alleviated the situation to some extent, but the "tattle-tale gray" market is swiftly moving into a darker phase. Glass, sodium bichromate, and phosphates will be among the hardest-hit.

The impending shortage of phosphates, as a result of the above, has already resulted in a change in formulation of mixed-base detergents, vis., those containing both sulfated alcohols and alkyl aryl sulfonate. The latter requires less phosphate builder (CI, July 1950, p. 61) and producers are incorporating higher proportions of it to save on phosphates. Shortage of benzene is an obstacle here, but sulfonate makers feel that toluene alkylates, despite caking problems, can be substituted as a last resort.

* * CI * *

Dow Chemical Co. has licensed from Columbia Chemical Division the liquid ammonia solvent-extraction process (CI, August 1948, p. 230) for purifying diaphragm-cell caustic soda to rayon-grade caustic. Dow will use the process at its Freeport, Texas, plant.

Size of Shell Chemical Co. can be deduced from figures reported by Shell Oil Co. and consolidated subsidiary companies. Gross sales of chemical products, mostly attributable to the chemical subsidiary, rose from $20 million in 1945 to $48 million in 1949. At the same time tonnage of products sold rose from 231,000 to 410,000.

Everyone wants to make a silicone-based polish. Latest to come out with such a polish for furniture is Silicone Products Co. of America (subsidiary of Cleveland polisher-maker Speco Inc.). Its Sil-9 has just been introduced in Cleveland, with national distribution to follow. Eight-ounce can sells for 98¢. The firm also makes an automobile polish, Sil-7.

Speaking of silicone auto polishes—manufacturers are finding that results vary with type of finish, length of baking cycle (in case of alkyd types), etc. Differences are not only apparent between makes of cars, but also between different models of the same make.

* * CI * *

Production capacity for Ozark-Mahoning Co.'s fluophosphoric acids was recently increased 20-fold, making larger amounts available at a lower price. Shipments to an oil company of 3,000 lbs. for a large-scale test in an undisclosed application may mean the beginning of a regular commercial use.

A synthetic detergent bar and a cellulose sponge into which it fits are being sold in New York City department stores as a kit for dishwashing and household cleaning. Called Kangaroo, the sponge can be refilled with small cakes selling for 98¢ a dozen. Charles Dupuy Associates, Allendale, N. J., makes the combination.

* * CI * *

A new Yonkers, N. Y., firm, New Erasole Products Corp., is test-marketing a line of aerosol-packaged paints in the New York area: both black and white enamel, spar varnish, bronze and aluminum paints. An 11-ounce can sells for $1.69 (except the aluminum paint: $1.59).

Among new cosmetic aerosols are Coppertone Sun Tan Oil and Isofoam sunburn ointment, both products of Douglas Laboratories, Inc., Miami, Fla. Packaged in the new Sun Tube aluminum container, they have been sold at Miami Beach, will be promoted extensively in resort areas this winter, with national distribution scheduled for next summer. Revlon Products has an aerosol shampoo, "Snow Creme," but doesn't plan to bring it out until next spring.

* * CI * *

Here and There:

Air Reduction Co. may build carbide and acetylene production capacity costing as much as $10 million as soon as capital and operating cost estimates are completed sometime this year. The acetylene will be for chemical uses. A new plant design is expected to make carbide (and thus acetylene) at substantially lower than present cost. . . . Fulfilling a report two months ago (CI, June 1950, p. 824), Victor Chemical Works has announced plans to construct a new elemental phosphorus furnace. It will be located near Butte, Montana. . . . A new type of synthetic fiber is suggested by a series of U. S. patents assigned to Celanese Corp. Linear polymers containing 4-amino-1,2,4-triazole rings are produced from linear dicarboxylic acids or amides and hydrazine or hydrazides (Nos. 2,512,599-2,512,601, 2,512,624-34) and made into fibers, bristles, or films (No. 2,512,891).

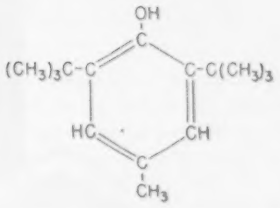
The Editors

KOPPERS

DI-tert-BUTYL-para-CRESOL

is a highly-effective antioxidant

DBPC

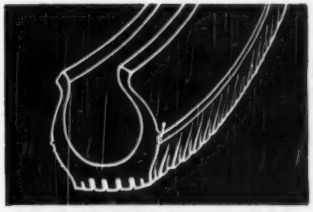


● Koppers 2,6-Di-tert-butyl-para-cresol (DBPC) is a crystalline, tri-alkylated phenol, easily soluble in common organic solvents. Being a hindered phenol, it undergoes few of the reactions typical of unhindered phenols, such as phenol and meta-cresol.

Koppers DBPC is an oxidation inhibitor that is non-staining and non-corrosive; it is insoluble in aqueous solutions of acids or alkalis. For the rubber, petroleum and insecticide industries, DBPC has proved its value as a highly-effective antioxidant.

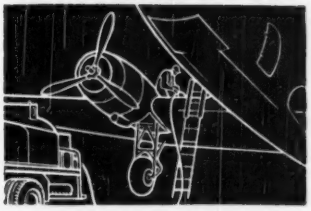
FOR FURTHER INFORMATION . . . write for your copy of Bulletin C-9-115. It describes in detail the properties, reactions and uses of DBPC. A four-ounce sample of DBPC will be sent to recognized laboratories when requested on company letterheads.

for these industries



RUBBER

DBPC is useful as a "non-coloring" and a "non-staining" rubber antioxidant, because it causes little or no discoloration of white or light-colored rubber products, even after prolonged exposure to light, heat and air.



PETROLEUM

DBPC is an excellent antioxidant for high-grade lubricating oils for low-temperature service such as spindle oils, gun greases, waxes, etc., and for such oils as turbine oils and transformer oils. In these oils, it inhibits the formation of gums and acidic products which are formed due to oxidation.

It is also one of the most effective inhibitors for the reduction of gum formation in aviation gasolines, where it is important to effect the inhibition without the production of undesirable deposits of residues in carburetors.

INSECTICIDE

DBPC is particularly effective in the prevention of oxidation and deterioration of insecticide compositions containing pyrethrin. Pyrethrin has a marked tendency to decompose on exposure to light or air; such decomposition results in a marked decrease in the insecticidal value of the product. DBPC inhibits these oxidation processes, thus prolonging the potency of the insecticide.

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Sodium Sulphate

Sodium Chromate

OVER FORTY YEARS OF PROGRESS

NATURAL PRODUCTS REFINING COMPANY

JERSEY CITY, NEW JERSEY

BOTH SIDES OF THE HALF-CENTURY

by ***HOWARD C. E. JOHNSON, Managing Editor***

CHEMICAL INDUSTRIES' Sixth Annual Survey of New Chemicals and New Equipment comes just a few months before the mid-century mark is reached and passed. It is well to stop for a moment along the road—to look back the way we have come, and look ahead as far as we can in the direction we're going.

No one can deny that we've come a long way. At the turn of the century the chemical industry was a lump the size of a pea; synthetic dyestuffs were still a German monopoly; "artificial silk" was still a dream; and practically the only plastic was celluloid. Statistics could be cited and more facts added, but they would only reinforce what we already know—that very little chemical processing was being done, and what was being done was largely empirical.

The progress that has been made in the last fifty years is widely regarded as a triumph of technology—like mass production or the airplane. It is that, certainly, but it's a great deal more.

The automobile, the airplane, and the pop-up toaster—true children of technology—were seen in the mind's eye before they existed. The many men whose individual contributions are embodied in the admirable results you see today in your dealer's showroom or at your local airport knew what they were after, and they improvised and modified and improved until they got what they wanted.

But the strong foundation underlying the chemical industry is something quite different: It's wanting to know why before knowing what it's good for. It's getting bushels of experimental facts—just for the fun of spinning theories that reconcile them. In short, it's fundamental research that has made plastics, synthetic fibers, pharmaceuticals and aviation gasoline possible.

A foundation alone, of course, isn't much good; and the superstructure of technology has made billion-ton production figures possible. New alloys, well-designed process equipment, automatic instruments and similar tools of the engineer have turned fine theories into practical facts.

The half-century mark, then, reveals great accomplishments both in the science and technology of chemistry; but these very accomplishments have engendered new problems for future solution.

The past role of the chemical industry has been to utilize cheap raw materials in synthesizing or simulating natural products so that people who couldn't afford Tyrian purple could have a coal-tar dyestuff of the same shade. By making material things cheap, the industry has enormously multiplied demand.

A peak rate of civilian demand, coupled with unforeseeable but potentially enormous military needs, has already brought the industry to the point where it's synthesizing raw materials (e.g., benzene) as well as products. Industry will have to learn to cope with one eventual shortage after another.

The role of chemicals in living organisms is another little-understood problem. Will new insecticides (or antibiotics) constantly have to be discovered because insects (or germs) have learned to tolerate those in use? Will the chemistry of cancer and leukemia and arthritis be elucidated?

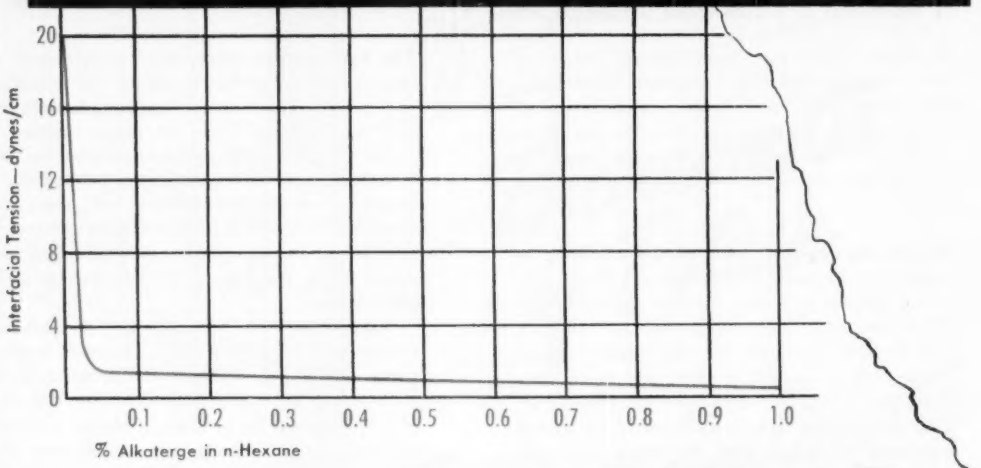
No, progress is nothing to be smug about. Chemist E. E. Slosson put it aptly when he compared the illumination of science to a campfire: The brighter it glows, the more darkness is revealed beyond the widening circle of its light.

It is often unthinkingly felt that the fire-tenders are to be found only in the colleges and universities and other non-profit institutions—that the profit motive is somehow incompatible with real research. Time and time again industry has given the lie to that fallacy; and the compilation of achievements published in this special issue is further evidence that industry—geared to the satisfaction of human wants and needs—uses research as its chief tool.

This issue is again scheduled to coincide with the National Chemical Exposition at Chicago. Observable at the Exposition will be many of the new products described in this issue—products which are not so much achievements of the recent past as tools to shape the industry's future.

ALKATERGE-C

oil-soluble wetting agent



Just 1/25 of 1% of Alkaterge-C—that's all it takes to reduce the interfacial tension between n-hexane and water to one dyne per centimeter. In mineral oil, 0.1% reduces the interfacial tension to approximately one to two dynes per centimeter. That's why Alkaterge-C is such a successful oil-soluble wetting and auxiliary emulsifying agent. It's a sort of chemical lever—makes it easy for the emulsifying agent to do its job. This striking effect on interfacial tension suggests many applications in connection with lubrication, extraction, and impregnating operations.

This non-volatile, amine-type compound reacts with acids to form salts and soaps which are themselves emulsifying and wetting agents. Salts of the mineral and lower aliphatic acids are water-soluble. With the higher fatty acids, Alkaterge-C forms oil-soluble soaps. These salts and soaps have been used as wetting agents and penetrants in metal cleaners and in the processing and impregnating of textile and paper products.

Alkaterge-C also has many uses based on its acid-accepting and surface-active properties. It is an effective anti-foam agent, especially when used in conjunction with mineral oil, and it is also an excellent pigment-grinding assistant in mineral oil vehicles.

We will gladly furnish you with a sample and additional data upon request on your company letterhead.

PROPERTIES (of commercial-grade material)

Molecular and Equivalent Weights	350, approx.
Coefficient of Cubical Expansion (20° to 30°C)	0.0008 per 1°C 0.0004 per 1°F
Distillation Range at 3 mm of Mercury	194°C to 310°C
Solidification Point	—36°C, approx.
Surface Tension of Saturated Aqueous Solution:	Less than 45 dynes/cm
Interfacial Tension against Water of a 0.1% Solution in Mineral Oil	1 to 2 dynes/cm
Flash Point, Cleveland Open Cup	430°F
Solubility	
in Water	Less than 0.002% by weight
in Mineral and Vegetable Oils	Miscible
in Organic Solvents	Miscible with naphtha, benzene, kerosene, carbon tetrachloride, ethyl acetate, acetone, methanol, butanol, and most other organic solvents.

SPECIFICATIONS (tentative)

Oxazoline Content	70% by weight, minimum
Specific Gravity, 25°/25°C	0.925—0.931
Nitrogen (Kjeldahl)	3.80—4.10% by weight
Color, Gardner Scale	15 maximum
Appearance	Clear, free from suspended matter

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CSC

Chemical Industries

AUGUST, 1950

What's new

POLYETHYLENE PROGRESS

Host of new uses pushes polyethylene into the limelight. Film and sheeting account for major share of 75 million-lbs.-per-year market.

MANY in the know feel that polyethylene will soon be the most important plastic in terms of pounds produced. A unique combination of physical properties and low raw materials cost would seem to justify this conclusion.

From a standing start, expansion got under way in January 1943 when Carbide and Carbon Chemicals Corp. installed a million-pound-a-year unit at S. Charleston, W. Va. The latter part of the same year saw Du Pont start up a second installation, almost as large, by the then Ammonia Department—now Polychemicals Department—at Belle, W. Va.

Let's Make Some More

These initial units have been followed by a series of expansions by both companies. Today it is estimated that Du Pont's capacity, mostly at Orange, Texas, has reached nearly 50 million pounds per year of polymer. Adding the capacity of the only other producer, Bakelite Division of Union Carbide and Carbon Corp., brings the total up to an impressive 75 million pounds per year. And the market shows little if any sign of saturation.

. . . And Still Some More

Chemical makers—like nature and a vacuum—abhor unsaturated markets and new plant facilities soon dot the landscape. However, expansion of polyethylene production, although very rapid, has not rushed along at the phrenetic pace of certain other commodities. Too much of the cost of the product is represented by amortization of the extremely expensive production units—pressures required range up to 1500 atmospheres *(CI, Feb. 1947, p. 219)*. Thus, all demands probably will not be met for some time as producers feel their way toward the plant capacity ultimately needed.

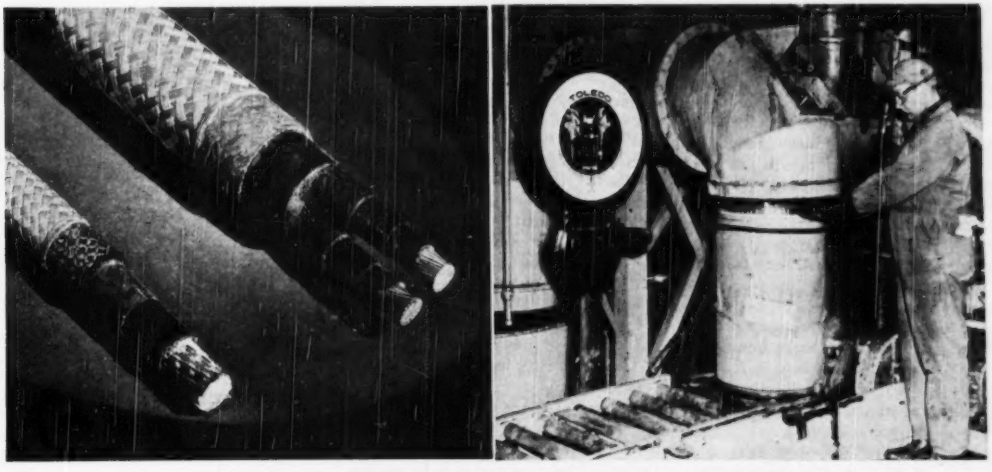
Despite this high capital cost of plant, the picture is so encouraging that other companies—Standard Oil Co. of Ind. *(CI Newsletter, July 1950)* is the only one which has been named—have taken first steps to get into the business. Pilot plants are in operation and samples of the product are being distributed for customer testing.

Unique Combination

The relatively unlimited supply of low-cost raw material, ethylene, plus the polymer's unique combination of physical properties, provide a firm basis for being bullish on polyethylene.

It has unparalleled resistance to low temperatures. Most plastics, even with large amounts of plasticizer, become brittle at low temperatures. Polyethylene requires no plasticizer. It has the lowest specific gravity (0.92) of any plastic. This is of utmost importance in an industry where most uses are based on a volume requirement and the products are usually sold on a cents-per-pound basis. Thus polyethylene, although costing more per pound than the heavier vinyls, is still more economical to use.

The need for material with good electrical insulating properties at both low and high frequencies for radar circuits during World War II provided the first impetus to large-volume production. Until 1948 its use as electrical insulation remained the most important poundage use. Today polyethylene sheeting and film take up nearly half of current production, most



CABLE INSULATION AND PACKAGING: The latter soon outstripped the former.

of it being used for packaging. The Korean war could well reverse this situation as more polyethylene is used for radio and radar insulation.

Premier Packages

Good resistance to water vapor transmission, high tensile strength, maintenance of strength at low temperatures, and extremely good resistance to deterioration by solvents and corrosive media all combine in polyethylene to provide a premier packaging material.

Resistance to solvents is a mixed blessing: It adds to the difficulties of using polyethylene as a coating material by the most common means, viz., application of a solution in a volatile solvent to a surface by either a brush or spray gun. It must be applied by one of several melt-coating methods. At the moment flame-spraying is the best known, but other methods now in the laboratory have shown excellent promise for certain applications.

Also in large-scale use is the drum liner insert fabricated from 60-mil polyethylene sheeting. This insert, of the same size as the drum and placed in the container before filling, is sealed before the drum is closed. This liner makes it possible to replace a stainless steel container with a carbon steel drum plus a relatively inexpensive polyethylene insert. Also, it is readily disposable where hazardous chemicals are being carried. A similar liner or a paper laminated with polyethylene is used as the inner wall in many multiwall bags *(CI, Jan. 1950, p. 102)*.

Sheeting Is the Largest

But the largest amount of the sheeting sold has a thickness of five mils or under; and such sheeting, it is believed, accounts for some 10%-15% of the total plastic film market. Until recently it could not be used on automatic packaging machinery because the electrical insulation properties of polyethylene permitted a buildup of static electricity which interfered with separation of the individual sheets. Nor, could the film be printed on. However, these two problems have been solved.

Today printed polyethylene film is being used on automatic packaging machinery to form individually printed packages for any powder or liquid that can be metered or will flow *(CI, April 1950, p. 500)*. Printed sheeting from a roll is fed in and a heat-sealed package of the product emerges.

The resistance of polyethylene film to flex-cracking at low temperatures accounts for another major film use: packaging of frozen foods. It also is used as a high-strength transparent sheet for packaging such materials as textiles that are handled a great deal before sale. The customer can examine the article without soiling it. Cellophane is so much cheaper and decorative that polyethylene film, however, will not replace it except where its properties warrant the extra cost.

Super Paper

Extremely thin film of polyethylene are almost as resistant to water vapor transmission and flex-cracking as thicker sheets. Thus, paper coated with a half-mil film of polyethylene (by an extrusion process) is as good in many respects as the sheeting.

Another method of coating paper also utilizes polyethylene: Small quantities are added to paraffin wax before the latter is coated on paper for bread wrappers and other like uses. The resultant increased strength of the coated paper permits a decrease in total quantity of paraffin required and also cuts down losses on returns of broken packages. For this application, a lower-melting resin (m.p. 125°C.), which will dissolve in the molten paraffin, is required. On cooling, this solution forms a dispersion of polyethylene in paraffin.

Fabrics can also be toughened by coating with polyethylene. Such fabrics are already giving good service in such heavy-duty uses as seat coverings in public conveyances.

There are many possible uses for polyethylene waxes, lower polymers of ethylene obtained by carrying out polymerization at a lower pressure. At present their importance is more potential than actual, but, undoubtedly they will eventually occupy a prominent place in the polymer firmament.

Surface Only Scratched

There are many other highly promising uses for polyethylene. Its high resistance to corrosion and solvent deterioration are being put to use in fabricating massive pieces for such items as piping. Complex shapes can be fabricated by welding techniques that have been developed.

Polyethylene fibers are also under investigation, but little is known of the success of these studies.

The foregoing represent only the "cream of the crop" of polyethylene uses. New uses are turning up almost by the hour, and much additional poundage will be required before enough of the material will be on tap to fill all demands.

HEADBOX HERO

New wet-strength resin gives stronger paper than straight ureas, is cheaper than melamines.

PLASKON Division is out to win papermakers' hearts with its new wet-strength resin, Plaskon aminoplast, which has emerged from the field-testing stage and is now being used commercially.

The resin is a modified urea formulation which, says Plaskon, combines the convenience and economy of currently-used ureas with the high-strength results obtained with the more costly melamines.

DAVE HATCHER: His child's agent.

Researcher Now Selling

Associate director of research at the time the new resin was in the laboratory, Dave Hatcher was the man primarily responsible for its development. Now, as sales manager for glues and industrial resins, he's out peddling his child's talents.

The talents he's selling—and has already sold to the Brown Co., Hoberg Paper Co., and the Gilman Co., among others—include complete lack of effect on absorbency. Most resins require use of alum, which decreases absorbency. Since Plaskon aminoplast gives high wet strength without the use of alum, it works well on paper towels and other absorbent tissues.

It also has good "shelf life." Prepared solutions don't deteriorate on a few days' standing; and on the other hand it isn't necessary to age solutions before use.

Lower Cost Claimed

But the advantage Hatcher talks

about most is low cost. Compared pound-for-pound with urea resins, aminoplast imparts more than twice as much wet strength, but it costs less than twice as much. Thus the papermaker can buy more wet strength for his products at lower cost per "strength unit", or he can maintain his present wet-strength quality at lower cost.

Compared pound-for-pound with melamines, says Hatcher, aminoplast is cheaper and just as good or better. Commercial results, he says, show savings up to 30%.

Applicable to bleached and unbleached kraft, sulfite, rag, sulfite-groundwood and kraft-groundwood pulps, the new resin is applied much like urea resins. Chief difference is that it is preferably added to the headbox of the Fourdrinier paper machine rather than to the beater.

KICK FROM KOREA

Civilian chemical consumers are in for a belt-tightening as industry approaches a war footing.

WARS always cause a violent upheaval in a nation's economy. Although small as wars go (as this is written) the scrap in Korea will probably have a much more rapid and violent effect on the chemical industry than have past wars.

The last time there was unused capacity for practically all materials. This was a shock absorber while the nation regrouped its economic forces and went on a war footing. Despite addition of many new production units and a great expansion of plant capacity since 1945, this is not true today.

Hitting The Ceiling

Since the first of the year, production of practically all chemicals has hit the ceiling; there is little idle plant capacity. Demand has been at such a high level that any war requirements for chemical products will have to be excised from civilian consumption.

For example, sulfuric acid production, the old business barometer, has increased from a then-new record of 31,200 tons per day last December to 35,600 tons in May. As yet the production curve has not quite bumped the ceiling of total capacity, but this is only because of the normal April letdown of phosphate fertilizer production. This is the first year since the postwar year of readjustment, 1946, in fact, that production in April and May has not dropped from an annual March high.

This high rate is not due to any one or even several new uses. Rather it is caused by the generally high level of business activity (*CI, July* 1950, *p.* 23). On top of this, much acid will be required to keep the military machine running: for high explosives; metal working; alkylate, so necessary for high-octane gasoline; and fertilizers.

Started Before Korea

Another indication that the industry is bumping its head on production ceilings is the experience of process equipment producers and engineering and construction firms since early April. New business began picking up then and has been increasing since that time. One major concern found it necessary to take new office space. Another construction company signed more business in one week than it had in the previous several months, not including a couple of big contracts on which its legal staff was ironing out final details.

Shooting in Korea did not in itself cause the present boom. The process industries had decided that there was inadequate capacity long before the shooting started and was taking steps —slow ones to be sure—to remedy the defect. The shooting only stepped up the pace and now the primary question is, "Can we get sufficient steel in time to fill the orders?" This is a very real question. Example: One equipment maker had to haul two carloads of steel from the West Coast to the Middle West to meet commitments.

First Absentees

Any plant now under construction will require months to complete. In the meantime shortages will develop.

At this early stage it is extremely difficult to identify the first absentees from the lineup of chemicals in adequate supply. A few, however, can be spotted. Strikes at two major soda ash producers will mean supply problems for some time to come.

It seems, too, that the benzene shortage is always with us. Premiums were being paid last December and since that time synthetic rubber production and the accompanying styrene requirements have put a further plus factor on price. Two plants are producing it from petroleum but any other possible synthesizers are now doing a double take as they try to evaluate the effect removing any aromatic or naphthenic hydrocarbons from gasoline will have upon its antiknock and rich-mixture performance. More tetraethyl lead will aid in antiknock but not in rich-mixture performance; and more TEL means more chlorine will be needed.

TEL is not the only consumer of chlorine whose requirements will increase. DDT will be required in large quantities as troops move into insect-ridden areas. Chlorine is a major component in such smoke producers as titanium tetrachloride and hexachloroethane. Need for vinyl-resins—large consumers of chlorine—will probably increase. And chlorine is short.

Glycerine is always squeezed by war, and the large-scale use of airplane-borne rockets fueled by a double-base powder containing nitroglycerin will not help the supply situation. Additional synthetic glycerine, moreover, will require more chlorine.

Supply position of heavy metal salts in general has greatly tightened. The soda ash strike is bound to reduce chromate and bichromate production —drastically and soon. Nickel, too, will be needed for the high alloy steels used in armor.

More ethanol may soon be required. However, unless synthetic rubber grows much larger than presently indicated, little difficulty is expected.

Problem Child

Bright spots in the supply picture are acetone and ammonia. Explosives production, however, could well chew up a great deal of this available material. Caustic soda, now freely available, can be used to replace soda ash in the production of alumiña and soap. Thus aluminum to fabricate aircraft will probably be limited first by a power—not a chemical—shortage.

Long supplies of certain materials will be created as civilian consumption is preempted by military needs. For example, titanium dioxide has been short for many months. However, as soon as the President's restrictions on governmental credit for new housing take hold, curtailed paint requirements should give considerable relief. Such changes, combined with the high degree of integration of the industry, will make availability of chemicals over the next few months as difficult to predict as the changing moods of a problem child.

H-BOMB BY DU PONT?

IT LOOKS like the Du Pont Co. will build the hydrogen bomb for the Atomic Energy Commission. The company will design, construct and operate new plants to make materials—presumably including tritium — for atomic weapons or fuels. Du Pont wants only a dollar fee, with the Government to pay all costs, own all forthcoming patents.

What's new

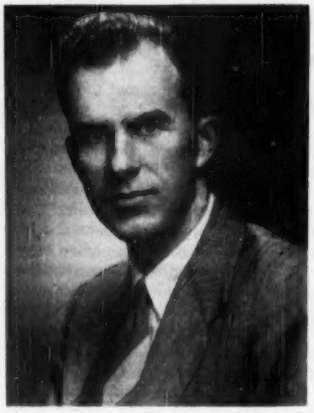
METAMORPHOSED CLAY

Organic complexes of bentonite thicken organic liquids, form non-melting greases of wide utility.

BENTONITE is a clay known for its strong adsorbing properties and its ability to swell in water. It doesn't swell in organic liquids.

At least, that's the way it used to be until John W. Jordan, Mellon Institute of Industrial Research, started modifying the mineral. He's responsible for its falling off the water wagon. Now water holds no attraction for it and it loves organic liquids.

The switch from hydrophile to organophile has made a new type of thickening agent available to the chemical industry. National Lead Co., sponsor of Jordan's work at Mellon, built a plant in St. Louis for such modified bentonites, appropriately trade-named Bentones, and has been turning them out on a commercial scale since last March. Their current major use is in greases where they replace metallic soaps, producing materials that have no melting points and give promise of wide use in high- and low-temperature as well as in general-purpose lubrication. Such lubricants as Plastilube of the Warren Refining & Chemical Co., Cleveland (*CI, May 1950, p. 724*) are being used in steel mills, rubber mills, kilns, contractors' equipment, etc.



JOHN W. JORDAN: Off the water wagon.

Started With Oil

In being used in the form of Bentones to thicken oil, bentonite comes full circle. One of its principal uses has been in oil well drilling muds. National Lead's Baroid Sales Division has been in this business for years, and in 1941 decided to explore the chemical possibilities of bentonite. (Its other major uses are in foundry sands and in filtering and decolorizing oils.) The company established the fellowship at Mellon, and Dr. Jordan started to investigate fully the discoveries of E. A. Hauser, Massachusetts Institute of Technology professor, that certain organic compounds of bentonite swelled and dispersed in organic liquids.

The resulting Bentones are reaction products of bentonite of the Wyoming type—principally sodium montmorillonite—and organic cations. A quaternary ammonium or amine salt, usually the chloride, is used. Bentonite is first hydrated in about a 3% aqueous dispersion to separate it into fine particles, then decanted and supercentrifuged to remove non-clay particles, especially quartz with its undesirable abrasive characteristics. A water solution of the organic base is added to this dilute dispersion, and the precipitate of Bentone, in which the sodium atoms are replaced by the organic cations, is washed, filtered, dried and pulverized.

The original sodium montmorillonite is a hydrous aluminum silicate composed of platelets of very small ultimate particle size. In water, it separates into these particles with each platelet orienting water around it in hexagonal configuration and giving rise to thixotropic gels. By proper choice of organic cation to replace the sodium, this hydrophilic property can be controlled. A short-chain alkyl ammonium salt gives a Bentone slightly organophilic, but retaining much of its original hydrophilic properties. Increasing the chain length gives increasing organophilic properties at the expense of the affinity for water. A quaternary ammonium salt with two chains of 16 to 18 carbon atoms, for example, gives a completely hydrophobic and organophilic material that has improved heat stability.

New Coating

Since the hydrocarbon chains coat the platelets, such products disperse in many organic liquids to their ultimate platelets as readily as their sodium predecessor did in water, and similarly bind the organic liquid in oriented layers. This gives gel systems in which the organic liquid phase is held immobile around an extremely small hydrocarbon-coated montmorillonite platelet.

To prepare a grease, Bentone (from 8-10%) is stirred into oil and the dispersion is passed through a colloid mill. Since the gel obtained does not depend upon maintenance of a matrix to hold the oil, there can be no change from solid to liquid phase as occurs with soap-and-oil greases when the temperature rises. The Bentone particles have essentially lost their identity because of their minute size, hydrocarbon coating, and the countless layers of oil surrounding each platelet; hence characteristics of the grease are those of the oil employed.

In addition to the striking non-melting characteristic of such greases, they are outstanding in water resistance, adhesion to metal, and stability. Performance characteristics are such that some people in the industry feel Bentone greases may eventually win more than half the market for greases. Bentone requirements for which would be about 50 million pounds a year. In extending the temperature range of grease beyond that of soap greases, they are able to do some jobs for which silicone greases have had to be used. The Bentones themselves are useful to a limited degree in bodying silicones for low- and moderate-temperature work, but at elevated temperatures they cause the silicone either to depolymerize or to resinify.

Bentone greases are now competitive with barium and lithium greases. Since Bentone production has only recently begun at the St. Louis installation, engineering data are still being collected with reference to process improvement. As with all new products, wider markets and lower costs can be anticipated. All the major oil companies are interested, and that could result in a sudden mushrooming demand for these novel thickeners.

Universal Kinship

Although greases seem like the big outlet at the moment, Bentones' attraction for organic liquids can be exploited in many applications. In adhesives, particularly rubber-based types, they not only body the material, but improve bond strength and water resistance. As thickeners for paint, they impart better flow properties and retard pigment separation. Plastisols and organosols can be advantageously thickened with Bentones to cut down sag in dipping applications, or to allow spreading by hand for laminated products. Used to thicken paint removers, they don't leave a waxy residue on the surface.

Bentones control consistency, give better printing in textile and ordinary printing inks. In asphalt and coal-tar products, they increase resistance to temperature, reduce sag, and aid in producing harder and stronger impregnated products, etc. The tensile strength and hardness of waxes, too, can be increased with them, and the softening temperature of impregnants raised. Production of such things as gelled fuels suggests other uses for the new materials that body solvent-containing formulations.

Only two are now available: Bentone 18 and Bentone 34. The former, product of a primary amine (the number indicates the number of carbon atoms) is used in a mixture of polar and non-polar solvents. The latter, produced from a quaternary ammonium compound with two long fatty acid chains and two methyl groups, finds its primary use in single-phase, non-polar systems, and hence is used in the greases. Others have been prepared and Jordan expects more of his compounds to become commercial products as he investigates their likes and dislikes.

COLOR CATCHER

Porous phenolic resin adsorbs colors, has no effect on ions.

IT LOOKS like an ion-exchange resin, operates like one, but isn't one. Chemical Process Co.'s Duolite S-30, a porous phenolic resin adsorbent, owes its conception to ion exchange, but their paths have since diverged.

Designed to remove colored organic impurities from solutions, the new resin has been field-tested during the past year, is now ready to move into commercial use.

Duolite S-30 is an outgrowth of ion-exchange studies on various sugar solutions. During these investigations it was noticed that an anion-exchange resin not only took out the anions, but most of the color as well.

Not Exchange

This curious observation was pursued further, and it turned out that if ion exchange had anything at all to do with color removal, it certainly wasn't the whole answer. For example: Ammonia-regenerated resin adsorbed anions better than it did color, while caustic-regenerated resin adsorbed both equally well. Also, different resins of comparable exchange capacities differed widely in color removal, and the same resin gave different results with different solutions. Strangest of all, a completely exhausted resin still removed color effectively.

Chemical Process Co.'s B. N. Dickinson found that a porous phenolic resin—with practically no ion-exchange capacity—removed color better than any of the ion-exchange resins, taking out 99½% to 80% of the color, depending on how much solution was treated.

Versatile in Application

S-30 can be used in many different ways on many different solutions. One can use it, for example, in column or bed-type percolation; in slurry or batch-type applications with subsequent separation by hydraulic, centrifugal, or filter-press methods; or in a basket or bag immersed in the solution, much like a tea bag.

B. N. DICKINSON: It's not ion exchange.

Among the many liquids successfully treated in laboratory and field tests are beet, cane, and corn sugar solutions; protein hydrolysates; crude aqueous glycerine; food-processing dyes; and contaminated dry-cleaning solvents.

The resin works best in acid solutions (pH less than 5) although it is effective over a wide pH range. Per cent absorption falls off as more and more liquid is treated and there is no sharp "breakthrough" as in ion exchange. Traces of color are not readily removed, but passage of the solution through two or more beds in series improves total adsorption.

Easy To Regenerate

Chief factor contributing to over-all economy is ease of regeneration. A dilute solution of caustic (or soda ash or ammonia), in the amount of ½ lb. to 2 lbs. per cu. ft. of resin, followed by a dilute sulfuric acid rinse, restores the resin to its original capacity.

Duolite will have to compete with bone black and activated carbon, old hands at the color-adsorption game, but the resin will do some things carbon won't. Convenience of use and ease of reactivation are additional aces in the hole that Chemical Process Co. is counting on in its bid for color-removing business.

NUCLEAR NONSENSE

AEC deflates claims of atomic power enthusiasts.

ATOMIC POWER looks like duck soup to the Sunday-supplement scientist: Just fiddle around with the equation $E=mc^2$ and it's easy to show that a few milligrams of uranium will run Jack Benny's old Maxwell as far as 10 gallons of gas.

"Sub-sophomore slip-stick artists" is what Lawrence R. Hafstad, Director of the Atomic Energy Commission's Division of Reactor Development, called the purveyors of such nonsense when he talked to a group of automotive engineers in Detroit recently. "Let us give this old chestnut a decent burial," he added, "but with the utmost dispatch."

Won't Fit Vest Pocket

Then he went on to describe the solid progress that has been made toward the goal of atomic power and to sober his audience with a discussion of its economics.

With a sound but numerically inaccurate (for security reasons) mathematical exercise he proved that a controlled nuclear chain reaction—basis of atomic power—cannot take place except in a substantial chunk of uranium.

Dangerous by-product radiations make adequate shielding necessary—something like six feet of concrete or its equivalent. Says Hafstad, "Drop that in your gas tank if you can!"

Another limitation lies in the materials of which the reactor must be built. Uranium itself is so difficult to fabricate that "any good . . . metallurgist . . . after making a brief study of the crystal structure and properties of uranium . . . would . . . recommend positively that his company use a substitute." The construction materials, too, must meet almost impossible requirements: it mustn't be damaged by radiation, it shouldn't absorb neutrons to the extent that it quenches the chain reaction, and it must stand high temperatures—for efficiency, the higher the better.

URANIUM ORE: A substitute is recommended.

Even if absolutely free electric power could be put on the bus bars at a central station, distribution costs are such that the consumer would save only 25% to 35% on his bill. Since a nuclear reactor would replace only the conventional fire box and boiler—all the heat transfer apparatus, turbines, generators and distribution system remaining the same—the most sanguine optimist can hardly hope to save the consumer as much as the 25%-35% indicated above.

And there is no reason to think that the fuel cost will be less—at least for a long time. A typical coal-burning power plant costs $133 per kilowatt of installed capacity, and the annual operating cost is $56. With due regard for security, it isn't hard to arrive at capital cost figures between $11,000 and $14,000 per kilowatt of nuclear reactor capacity, based on the cost ($2688 and assuming 25% conversion efficiency) of four research reactors and on the appropriation ($25 million) for a proposed Navy submarine reactor (assumed to require 18,000 kilowatts).

Atomic power costs must come down by a factor of ten or more before economical civilian power is even conceivable. That old incentive, free enterprise, might figure out a way, but free enterprise is limited by stupendously high development costs and the need for secrecy.

Whence Uranium?

Assuming these problems could be solved, is there enough uranium? Energy content of known uranium reserves (as published before the war) is 10 times as great as that in known petroleum reserves, but 100 or more times less than that in known coal deposits. In view of high military demands it is conceivable that there will be little left over for civilian use.

Robert J. Wright, AEC geologist, had more to say last month about uranium mining prospects. Recent Canadian discoveries of primary ores point to increasing production there, and in this country pitchblende has been found in many abandoned mines. Also, many geologists believe that secondary surface deposits indicate primary deposits underground.

These are all high-uranium minerals—the kind found in large amounts only in Czechoslovakia, the Belgian Congo, northern Canada, and the Colorado plateau, all of which are being worked. Depletion of isolated high-grade ores will necessitate utilization of lower-grade sources like bituminous shale, much of which is found in the U. S., and radioactive phosphate rock, as found in Florida. Here getting the primary product and by-product uranium, both at profit, is a challenge to the ingenuity of the chemist and engineer.

They may succeed. But even if they do, next year's Buick will still undoubtedly have a gasoline engine.

SODIUM DUST

National Distillers Chemical Corp. develops more efficient way to use sodium.

PRACTICALLY every chemist has at one time or another transferred a chunk of sodium to a test tube half-full of toluene, cautiously heated it until the sodium was molten, and then shaken it vigorously until the silvery metal had again solidified.

Crude as the method is, the sodium "sand" thus obtained has a much greater surface area—and is therefore more reactive—than the same amount of lump sodium. But the "sand" particles, ranging from about 0.5 to 3 millimeters in diameter, are massive boulders compared to the micron-sized (0.001 mm) specks obtained by National Distillers Chemical Corp.'s new dispersion process.

Can Be Piped

Dust-sized sodium has a lot of advantages over the massive metal—or even the "sand." The dispersions—which are in toluene, xylene, kerosene, or other suitable hydrocarbons—are stable, and the particles don't coalesce even when they're heated above the melting point of sodium. Kerosene or xylene dispersions containing 50% sodium have the consistency of light oil at room temperature, and they can be pumped to reaction vessels like any other liquid material.

Once in the reaction vessel, the chemical advantages of dispersions show up: faster reactions, lower reaction temperatures and pressures, higher yields, and fewer side reactions.

These advantages are obvious and inevitable as a result of the tremendous surface area of the sodium. There is less local heating, greater homogeneity, and just simply less time for undesirable side reactions to take place.

Plant-Scale Process

National Distillers doesn't claim to have invented sodium dispersions. The idea has been kicking around for a long time, but no one had taken the

DISPERSION UNIT: A package deal.

trouble to reduce the idea to simple, commercial practice.* National Distillers took the trouble because it wanted to sell sodium (from its new plant at Ashtabula, Ohio, which just came into operation a few weeks ago).

A lot of sodium is used, but by relatively few people. Many others, thought National Distillers, could use it profitably—and would, if it were made convenient, simple, and relatively foolproof. (Too many chemists remember their college days, when they started near riots by disposing of scrap sodium in a nearby creek.)

So even before it had a pound of sodium to sell, National Distillers had a "package deal" worked out for its customers: not only the sodium, but drawings and specifications and know-how for making the dispersions. The company doesn't sell the equipment;

* Du Pont is carrying out similar research and has patents (U. S. Nos. 2,394,608; 2,487,333-4) in the field. Its researchers use dispersing agents and agitation (no colloid mill), attain particle sizes more or less inversely proportional to amount of dispersing agent added.

it merely provides the engineering data.

Colloid Mill the Key

In the plant-scale unit, sodium and the dispersing medium are heated to about 110° C. After the sodium is melted (m.p. 97.5°) the mixture is agitated, and dispersing and stabilizing agents are added. Stirring is continued until the mixture assumes a uniform light-gray color, whereafter it is passed through a positive- adjustment colloid mill with smooth-faced rotor and stator (Premier type). All operations are conducted under a nitrogen atmosphere. A unit employing a 4-inch mill has a capacity of 10 to 150 gallons an hour of dispersion, and requires a 6′ x 6′ working space.

Two typical sodium dispersions are formulated as follows:

(I)	Sodium	49.5%
	Crude kerosene	49.5
	Oleic acid	1.0
(II)	Sodium	49%
	Xylene	49
	Fatty amines	1
	Oleic acid	1

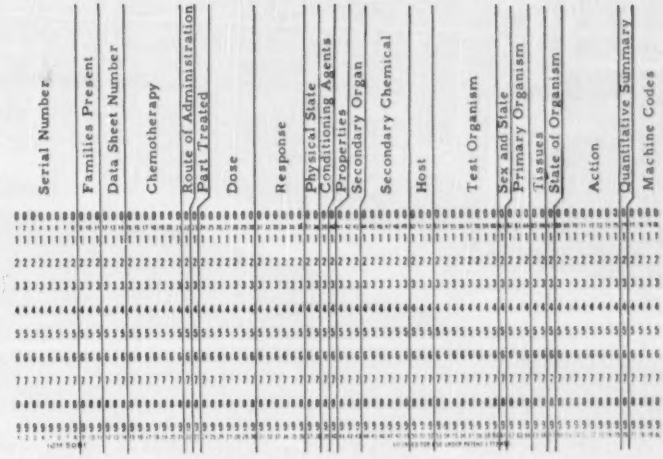
Various dispersing and stabilizing agents as well as dispersing media may be used, depending on the application. Some media such as crude kerosene, containing impurities that act as dispersants, so smaller amounts of added material are required.

Research Set-Up

For those who want to experiment with sodium reactions, National Distillers has designed a laboratory-size unit that turns out about a quart of dispersion an hour. In this unit the colloid mill is replaced by jet nozzle and baffle. The sodium-hydrocarbon mixture is pumped at high speed through the nozzle, and the sodium is broken up as the fluid mixture strikes the baffle plate. The mixture is recirculated until no further decrease in particle size occurs.

Sodium is a handy material to have around a laboratory or plant, for with it one can carry out acetoacetic ester-type condensations and Wurtz-Fittig reactions, desulfurize and purify hydrocarbons, catalyze polymerizations, prepare sodium alcoholates, manufacture anhydrous cellulose ethers, and reduce metallic chlorides to finely-divided metals. The list could be extended indefinitely.

National Distillers hopes that its dispersions will make many of these sodium reactions economically attractive, and that chemical manufacturers will exploit them. Then they'll buy sodium.



BIOLOGICAL CODE CARDS: Beats a mind reader.

DATA DETECTOR

Successful demonstration shows usefulness of IBM punched card system for correlation of large numbers of chemicals.

THE blindfolded mind reader at a side show has nothing on the Chemical-Biological Coordination Center of the National Research Council. With IBM machines and data compiled over a four-year period on IBM cards, the CBCC demonstrated its ability to answer many complex questions about medicinal chemicals such as anti-histaminic and anti-thyroid compounds.

The occasion was the First Symposium on Chemical-Biological Correlation held in May and sponsored by the Coordination Center. Typical of the questions asked and answered were these on anti-thyroid compounds:

"Which compounds have produced thyroid weights of 10-15 mg./100 gm. body weight or greater in any animal when administered in daily doses of 125 mg./kg. or less?"

"Do these compounds have any common chemical grouping?

"Are there chemical groupings which confer inactivity?"

"Are any compounds of molecular weight greater than 500 active?"

Chemical Code

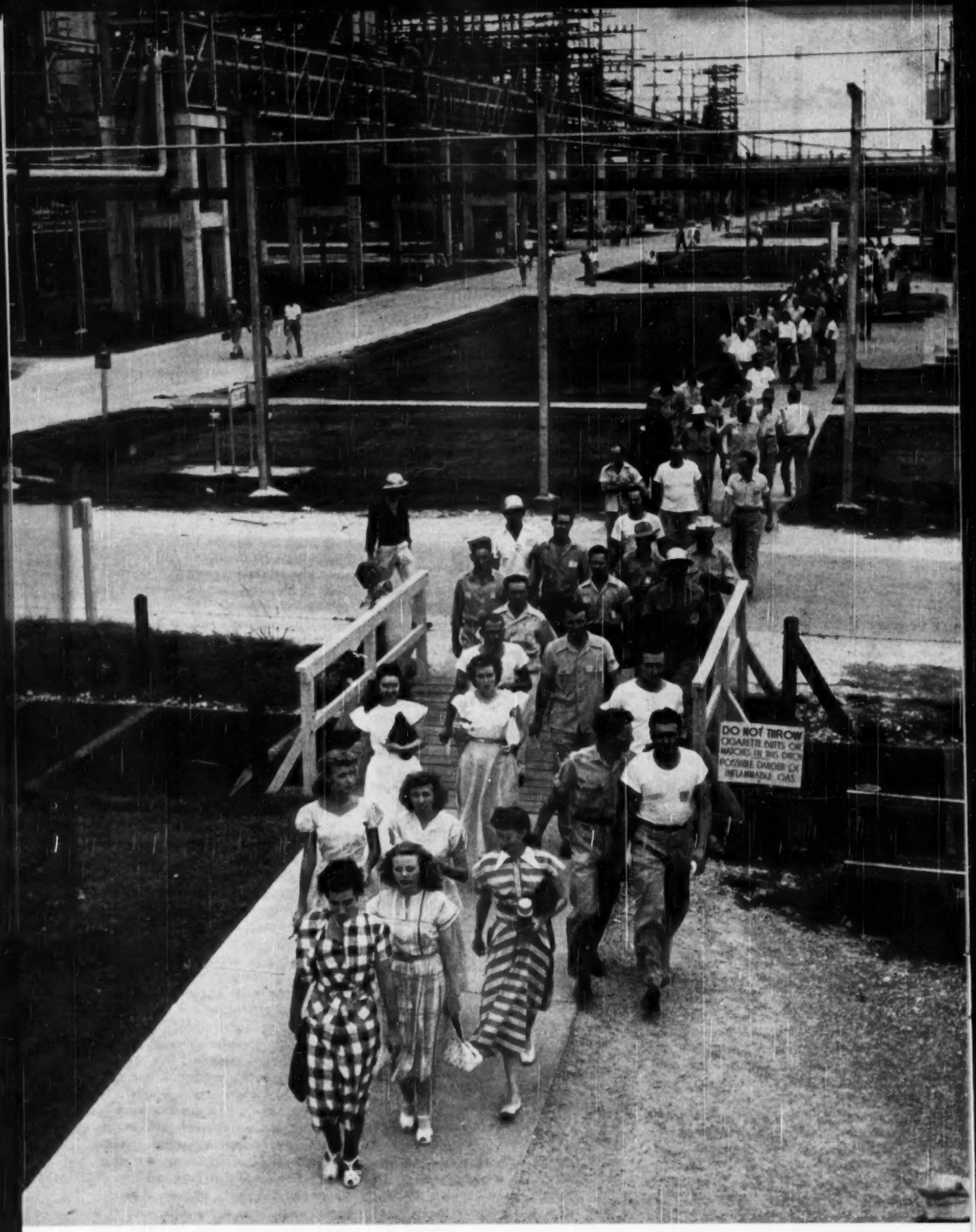
Here's how it's done. CBCC has developed two codes for use with the IBM punched cards. The first, the N.R.C. Chemical Code is available at nominal cost from the National Research Council, 2101 Constitution Avenue, Washington 25, D. C. It not only codes organic chemicals but contains the only available inorganic chemical code. It is not based on structure but rather on groups. The molecule is broken into groups and each group is coded separately. Except in a few cases it is impossible to reconstruct the molecule in its structural configuration; it is only possible to indicate which types of groups occur and how often.

This system is considered satisfactory for the intended correlation purpose. However, plans are being made to develop a physical-chemical code which will include such data as molecular weight, density, etc.

Biological Code

The second code, the Biological Code, is in the final stages of development. Through internal use at N.R.C. it is undergoing final checking and should be ready for publication within a year. This code is too complex to be explained in detail but the accompanying illustration of the code card indicates the scope of topics covered.

Chemical and biological information concerning each individual chemical is recorded on opposite sides of a data sheet. From the data sheet one or more punched cards are made up, one card for each biological action studied. To obtain the answer to a question such as "Do the active thyroid compounds have any common chemical grouping?" the IBM cards are used to prepare a frequency distribution chart of all involved chemical groups. It is expected that such use of the Center's codes, cards, and other facilities will do much toward influencing research in pharmaceutical synthesis.



Behind each of these chemical plant employees is about $14,000 invested in tools and facilities.

6th Annual Survey of NEW CHEMICALS and NEW EQUIPMENT

TOOLS FOR PROGRESS

by GEORGE W. MERCK
President, Manufacturing Chemists' Association, Inc.
President, Merck & Co., Inc.

George W. Merck

No INDUSTRY IS EVER BETTER than the tools it has to work with.

In this age our reliance on tools is so universal that it might be said that industrial progress in general is largely a reflection of the advances and improvements in tools of production and the skill to use them.

This is particularly true in the chemical industry. This industry is noted for its high capital requirements, the amount it spends on new equipment each year, its high rate of technical obsolescence. It is well advanced in the art of utilization of tools. How successful it has been is evidenced by a rate of technological growth that is unsurpassed anywhere in the world. Without such new tools as the mass spectograph, the vacuum leak detector, the molecular still, greatly improved automatic controls, and numerous other new processing materials and equipment, the great wartime and postwar strides in chemical industry development could not have been possible.

But now we face new tests. Our entry into the Korean war found our nation and our industry already working at capacity merely to fill peacetime needs. Increases in military requirements must be superimposed upon an economy in which output of goods and services is in excess of any former peacetime peak. In the case of chemicals and allied products, current production is far above what it was even at the crest of World War II.

We do not know what the demands on our industry will be over the coming months. If we should move into a full-fledged war economy we shall be obliged to put every tool and every facility at our command to useful purpose. We will again be under the strain of urgent demand for more and more production.

But whether in war or peace, our reliance on new and better tools of production will continue apace. Our industry is one that is geared to a rapid rate of progress. We are indebted to those who provide us with the tools—the new processing chemicals and equipment—that make this possible.

Cell room in National Distillers Chemical Corp.'s sodium plant, Ashtabula, Ohio. Portable containers in front of each cell are dumped daily to filters.

High Activity Marks Research and Development

6th Annual Survey of NEW CHEMICALS and NEW EQUIPMENT

• Every sector of the chemical industry has shared in the intense activity characterizing the period since CI's last review.

Tonnage oxygen and ethylene hold the spotlight in the aliphatics field, for from them stem the current interest in glycol, the Oxo and Oxyl reactions, and acrylonitrile. Among the new aliphatics attaining important stature recently are dimethylformamide, isobutyraldehyde, acrolein.

The big news in pharmaceuticals were the adrenal hormones (cortisone and ACTH) and glucuronic acid for arthritis. Antibiotics continued in high demand and a new one, Terramycin, was introduced. Vitamin A is now commercially synthesized.

Naval stores producers continued to derive new products from their basic raw materials. High-softening and chemically-inert polymers got most attention in the plastics field.

Coal-tar chemicals were sometimes short, and benzene is now made from petroleum. Biggest splash in the dye field was made by the "white dyes"—optical bleaches.

• Some 200 new chemicals, descriptions of which begin on page 245, indicate a year of high activity. The following reviews cover significant aspects of that progress.

ALIPHATIC CHEMICALS

by E. H. RIDDLE
Special Products Department,
Rohm & Haas Co.

AFTER a decade of continuously increasing demands, production figures for aliphatic chemicals in 1949 show almost universal declines compared with 1948. On the other hand, the reductions are small and the 1949 volume in most cases was equal to or more than that reported for 1947. Excess capacity now exists for most major aliphatic organics, but prices are holding fairly firm despite increased competition for the available business.

The Carthage Hydrocol plant in Brownsville, Texas, employing the American version of the Fischer-Tropsch process, is scheduled to begin operations in July; and in late July or August U. S. Industrial Chemicals expects to make its first shipments of acids, aldehydes, ketones, and alcohols from the water-soluble by-product of this plant. Stanolind Oil & Gas Co. is handling the separations. Long-term availability of C_6-and-higher alcohols, acids, and carbonyl compounds from the water-insoluble by-product of this plant has been indicated, although the separations are quite a problem. Higher α-olefins, which are straight-chain except for occasional methyl group, are also potentially available from this source.

A technique for separating linear aliphatics from branched and cyclic analogs by the formation of solid complexes of the linear components with urea has been described in the last year. This process is expected to provide an economic source of straight-chain paraffins when and if a market develops for such products. The method can also be applied to olefins and other non-paraffinic materials.

TONNAGE OXYGEN

Increasing interest is being shown in tonnage oxygen for use in the manufacture of aliphatics, with the two 1000-ton-per-day units in the Carthage Hydrocol plant dwarfing all chemical installations so far made. The latter includes the 175-ton unit in the now idle McCarthy Chemical Co. plant, which had been scheduled to manufacture formaldehyde, methanol, and acetaldehyde by oxidation of ethane, and a 360-ton unit at Du Pont's Belle, W. Va., plant which is used to make synthesis gas.

Besides its use for making carbon monoxide and hydrogen, oxygen may become important for manufacturing acetylene from natural gas, and it may still be used instead of air despite the failure of McCarthy's project for making oxygenated organics by hydrocarbon oxidation. While oxygen could also be used for converting ethane to ethylene, it is doubtful that this can compete with thermal cracking processes, such as Universal Oil Products' new autothermic process.

Ethylene is one of the most important roots from which the aliphatics tree grows, and, while the glamour of the new acetylene chemistry has stolen the headlines in recent years, ethylene continues to increase in importance and production volume. In addition to expansions by present pro-

ducers, new ethylene production will be required for the ethylene oxide-ethylene glycol projects of the Mathieson Chemical Corp. and a five-fold combine backed by the Chicago Corp. and Pontiac Refining Corp. An additional factor is polyethylene, rapidly approaching the top of the plastics heap, with estimated production of 35 million pounds in 1949 increasing to 55 million in 1950 and the end nowhere in sight.

The Mathieson project involves the formation of a new company, Mathieson Hydrocarbon Chemical Corp., which will obtain its raw material by stripping hydrocarbons (15-20% of the ethane and all of the propane and heavier hydrocarbons) from the natural gas pipeline of Tennessee Gas Transmission Co., without appreciably reducing the heating quality of the gas. Capacity of the plant for ethylene oxide and ethylene glycol, to be located in Kentucky, has not been announced. Other products, including acrylonitrile, are being considered for the future.

ETHYLENE GLYCOL

The Pontiac-Chicago project stems from the purchase, for $756,000, of an $8.5-million 100-octane government surplus refinery at Corpus Christi, Texas. This plant was unique, incidentally, in that it produced 100-octane gasoline components solely from light hydrocarbons contained in natural gas and without the use of crude oil. Initial ethylene glycol capacity of 60 million pounds a year is scheduled, plus an extra 10 million pounds of ethylene oxide, with preliminary planning started for other products including butadiene, ethylene dichloride, butyl alcohol and polyethylene.

An interesting sidelight of these two projects is the fact that Tennessee Gas Transmission Co. gets part of its gas from the Chicago Corp. wells in Texas.

In addition to this new ethylene glycol production, it is understood that Carbide & Carbon and Jefferson Chemical are expanding their capacity. Although there is no official confirmation, it is stated that Carbide's new unit, as well as the Pontiac-Chicago combine, utilizes direct oxidation of ethylene to ethylene oxide with a silver catalyst, rather than the traditional route through the chlorohydrin. Since Mathieson's plant is not near chlorine, it may also involve the direct oxidation process. Jefferson, on the other hand, is expected to continue with the chlorohydrin process. Direct oxidation of ethylene is stated to require a larger capital investment than the chlorohydrin process.

With all this new ethylene glycol capacity, one may well wonder where it is going to be used. Ethylene glycol production has increased by leaps and bounds in the last four years, and the new production units outlined above are believed to provide a total capacity of 750 million pounds, compared with 1947 production of 226 million pounds (and an estimated 420.5 million pounds in 1949). The only potentially large new market on the horizon is Du Pont's polyester Fiber V (glycol terephthalate), and this is not expected to become significant for several years.

Hancock Oil Co. is reported to be actively considering an ethylene glycol plant at Long Beach, Cal., with estimated capacity of 18 million pounds a year. This might be justified by increasing anti-freeze use on the West Coast.

As a further outlet for its ethylene oxide, Jefferson Chemical Co. is reported to be considering the production of ethanolamines.

ACRYLONITRILE

Ethylene oxide is also a possible factor in the future of acrylonitrile. American Cyanamid, the only acrylonitrile producer, has a capacity of 28 million pounds a year, but it is predicted that within 10 years, U. S. capacity will increase to 100 million, and perhaps 300 million pounds a year. This optimism results, of course, from all the activity on acrylonitrile fibres, which has been sufficiently well documented elsewhere to require no repetition here. While many different processes have appeared in the patent literature in recent years, two methods of making acrylonitrile appear dominant: the present process for adding HCN to ethylene oxide and dehydrating the resulting ethylene cyanohydrin, and the process, used by the Germans, for adding HCN to acetylene to give acrylonitrile directly. While the latter process looks good on paper, it has not always been so attractive in actual practice. Du Pont is reported to be operating a pilot plant for the acetylene-HCN process. Carbide, on the other hand, might favor the ethylene oxide process since it is a basic producer of this intermediate.

How many others will be producing acrylonitrile in future years is still uncertain, but it is known that at least eleven companies in addition to Du Pont and Carbide, have been working on processes in the advanced laboratory or pilot-plant stages.

Methacrylonitrile, which had been available from two sources in experimental quantities, has now disappeared from the market since its possibilities did not warrant commercial production. Several interesting processes have been described in the literature for manufacturing methacrylonitrile, including oxidation of methallylamine and addition of nitrosyl chloride to isobutylene.

Increased production of aliphatics in the Gulf Coast area as well as the competitive pressure to reduce costs has led to the shipment of chemicals in multi-cargo tankers from Texas to the East Coast. At least six companies are now transporting in this way a large variety of products, including alcohols, acetates, ethylene glycol, ketones, formaldehyde, carbon tetrachloride, ethyl chloride, and ethylene dichloride.

Du Pont has announced that a plant is under construction at Niagara Falls to double the capacity for making adiponitrile (and subsequently hexamethylene diamine for nylon) from furfural, with total furfural requirements estimated at 40 million pounds when the expansion is completed. In addition, a plant is under construction in Victoria, Texas, to make adiponitrile from butadiene, and the intermediate 1,4-dichlorobutene (a 60/40 mixture of the 1,4 and 3,4 isomers) is already available in limited quantities.

Dimethylformamide, a powerful solvent to be used for spinning Orlon, is now available in quantity from Du Pont's Graselli Department.

During the last year, Carbide & Carbon started producing ethylamines for the first time, in competition with Sharples, and increased its production of diisopropylamine. Commercial Solvents became the first West Coast producer of pentaerythritol, and both Jefferson Chemical Co. and Celanese Corp. added diethylene glycol to their list of products. Celanese also joins Dow and Carbide as a producer of propylene glycol, dipropylene glycol, and propylene oxide.

Monomer expansions continue with Du Pont announcing that vinyl acetate, now produced only at its Waynesboro plant, will also be manufactured at Niagara Falls; Dow will expand vinyl chloride production at its Texas plant. New facilities for ethylene dichloride and perchloroethylene will also be part of Dow's expansion at Freeport, the sequence of reactions being ethylene - ethylene dichloride - vinyl chloride-perchloroethylene.

Armour & Co. has started operations in its new plant in McCook, Ill., having a capacity for processing 100 million lbs. of fats and oils a year. This plant doubles Armour's previous capacity for manufacturing fatty acids, and increases six-fold the capacity for fatty acid derivatives (amides, nitriles, and amines).

The award for "Most Interesting Reaction" of the year in the aliphatic

field probably should go to the condensation of vinyl ethers with acetals to form alkoxyacetals from which aldehydes and alcohols may be obtained. The course of the reaction is

$$R_1CH_2CH(OR_2)_2 + CH_2{=}CHOR_2 \rightarrow$$
$$R_1CH_2CH(OR_2)CH_2CH(OR_2)_2 \rightarrow$$
$$R_1CH_2CH{=}CHCHOH_2 \rightarrow$$
$$R_1CH_2CH_2CH_2CH_2OH$$

It is believed that Carbide & Carbon is using this process (starting with the acetal of butyraldehyde) in its new plant for manufacturing *n*-hexyl alcohol. Compared with the old process of reacting butyraldehyde and acetaldehyde in an aldol condensation, which results in several unsaturated aldehydes, the acetal-vinyl ether reaction gives essentially one product. Some patents have recently been issued to General Aniline & Film on this type.

The Oxo process continues to attract attention with the recent announcement that Tennessee Eastman's new plant in Longview, Texas, will produce a mixture of *n*-butyraldehyde and isobutyraldehyde by the reaction of carbon monoxide with propylene. The *n*-butyraldehyde will be oxidized to butyric acid for use in the manufacture of cellulose acetate-butyrate. Isobutyraldehyde will be sold as such, giving a new source of this aldehyde presently available only in limited quantities.

Related not only to the Oxo, but also to the Fischer-Tropsch and synthetic methanol processes, is another alcohol-producing process introduced in this country by Blaw-Knox under license from two German concerns. Known as the Oxyl process, it makes a mixture of alcohols from one to twenty carbons by a catalytic, high-pressure synthesis from carbon monoxide and hydrogen. Differing from the Fischer-Tropsch process in operating conditions and catalyst, the Oxyl process is stated to give an 80% conversion to alcohols, with the remainder hydrocarbons (including a paraffin wax). An effective method for separating the components of the reaction mixture has been developed, and individual alcohols in a purity of 95% or better can be obtained, according to Blaw-Knox. It has been stated that Oxyl process plants can be built and operated economically in the United States under present conditions and prices at production capacities of 5 to 8 million pounds a year. The catch is the necessity for developing markets for such a wide range of alcohols.

ACROLEIN

Interest in acrolein has increased with Shell's announcement that its new pilot plant at Emeryville, Calif., is making acrolein by direct oxidation of propylene. Carbide may be doing the same thing, but has not acknowledged it. Coincidentally with the increased availability of acrolein at 50¢ per pound comes Dow's announcement of the first commercial scale unit for manufacturing synthetic methionine, one of the essential amino acids, for which one of the raw materials is β-methylmercaptopropionaldehyde from acrolein and methyl mercaptan. Carbide has started making ethyl acrylate from acrolein, and both Carbide and Shell have made available in experimental quantities a number of other derivatives of this reactive aldehyde. Methacrolein is also available from both companies in research quantities.

While the volume of acrylonitrile used for cyanoethylation reactions will probably never exceed its use in polymers, there is increasing commercial activity in cyanoethylation products. American Cyanamid has introduced three series of acrylonitrile derivatives in research quantities in the last year. The first is a group of dicyanoethyl derivatives: β,β′-oxydipropionitrile, β,β′-thiodipropionitrile, and β,β′-iminodipropionitrile. The second consists of acrylonitrile- amine adducts and their hydrogenation products: β-dimethylaminopropionitrile, β-isopropylaminopropionitrile, dimethylaminopropylamine, and isopropylaminopropylamine. The third group includes β-methoxy- and β-isopropoxypropionitriles and the corresponding methoxy- and isopropoxypropylamines. Carbide & Carbon is manufacturing commercial quantities of N-(3-aminopropyl)-morpholine and 2-ethylhexyloxypropylamine.

New β-propiolactone derivatives from B. F. Goodrich Chemical Co. include N-dodecyl-β-alanine, an effective surface-active material, and N-(hydroxyethyl)-β-alanine.

Other aliphatic chemicals made available in the last year include di-2-ethylhexyl sulfide, diethylpropanediol, di-(2-methoxyethyl) maleate, several alkylglycidyl ethers, and hydroxyisopropylglyoxalidine from Carbide & Carbon; chloroacetaldehyde, as a 40-45% aqueous solution, from Dow Chemical Company; isopropenyl acetate, an interesting monomer and acetylating agent, from Tennessee Eastman; pentaerythritol diacetals — the diformal, diacetal, dipropional, and dibutyral—from Heyden Chemical Corp.; methacrylamide and dicyclopentenyl alcohol from Rohm & Haas; sodium hydroxyethanesulfonate and hydroxypropanesulfonate, for use as detergent intermediates, from Wyandotte Chemical Corp.; dioctylphosphoryl chloride, from Victor; and vinyl trichlorosilane and diethyl dichlorosilane, from Linde Air Products.

A mixture of 80% cobalt acetylacetonate and 20% chromium acetylacetonate, produced by Union Carbide, is being test marketed as a combustion catalyst for gasoline, an interesting, though possibly uneconomic, application of the chelating ability of acetylacetone.

PLASTICIZERS

In the plasticizer field, adipate esters are making a big splash. Du Pont (di-3,3,5-trimethylhexyl, di-*n*-decyl), Godfrey L. Cabot (di-isoctyl, di-isobutyl), B. F. Goodrich Chemical (dioctyl), and Pittsburgh Coke & Chemical Co. (dioctyl and dinonyl) are producing the adipate esters indicated. In addition, Du Pont is supplying di-3,3,5-trimethylhexyl diglycolate, and Pittsburgh Coke & Chemical is a new producer of dibutyl and dioctyl sebacates. Ohio-Apex has introduced tributoxyethyl phosphate as a new plasticizer.

In the insecticide field, principal interest in the aliphatics category has centered around Carbide & Carbon's commercial production of allethrin, the synthetic analog of the active principle in pyrethrum. The raw materials for this complex cycloaliphatic ester are methallyl chloride, glycine, ethyl acetoacetate, allyl chloride, diethyl carbonate, and pyruvic aldehyde. All of these were already commercially available except pyruvic aldehyde, and Carbide has the know-how to produce this from propylene glycol, based on its glyoxal-from-ethylene glycol experience. Allethrin is expected to be competitive with natural pyrethrum, and is reported to have shown some superiority in residual activity.

Other cycloaliphatics which have rated headlines in the insecticide field include two diene adducts, Standard Oil Development's new fungicide, N-(trichloromethylthio) - tetrahydrophthalimide (which starts with butadiene and maleic anhydride), and Sharples' new defoliant supplements which are described as salts of 3,6-endoxophthalic acids, and are presumably derived from the adduct of furan and maleic anhydride.

An interesting new development in natural products is the increasing production of safflower oil, now being grown in the western part of the country. The plant produces an oil having color equal to soybean oil and drying properties equal to linseed oil. The growing of safflower plants has been a project of the University of Nebraska since 1942, and about 40,000 acres were planted in 1949, estimated to produce a crop of about 10 million pounds of oil. The one existing processing

plant at Longmont, Colo., can produce about a million pounds of oil per month. This oil has some interesting possibilities, if it proves all that its sponsors claim it to be.

PHARMACEUTICALS

by MARLIN T. LEFFLER
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THE development of several valuable medicinals during the past year has supported both foreign and domestic business. While drug exports climbed to a new high of $198 million, some 4% better than 1948, domestic sales showed only a slight increase. Conservative are the predictions for the current year as increasing production by foreign countries continues and drug exports may suffer devaluation in several countries. Sales in the United States are not expected to vary greatly from those in 1949, except as affected by growing acceptance of recently introduced, valuable medicinals. In many instances, profits have not kept pace with increased sales, due in large part to the gradual decline, particularly in antibiotics, of retail prices of pharmaceuticals. Improved production procedures have made possible such remarkable price reductions as penicillin from $20 per 100,000 units in 1943 to less than 12c in 1949, and streptomycin from $25 a gram in 1945 to $1 last year.

Antibiotics remain in control of much of the business, accounting for 43% of the 1949 medicinal export market with total penicillin production reaching 133 trillion units (27% increase over 1948) accompanied by an even more striking streptomycin increase of 100%, estimated production being some 80 million grams. Added to this are significant sales volumes of Aureomycin and Chloromycetin, with Terramycin just entering the market in recent months. Sulfa drugs, having slipped to a mere fraction of their original production, showed some increase in 1949. Antihistaminics crowded a total sales figure of $35 million in what was no doubt an unusual market.

Although both ACTH and cortisone had to remain on an experimental basis during the year, production of the former is currently some 30 times last year's with triple the output of a much more potent product expected by this fall. Cortisone predictions for 1950 reach figures of $10 to $20 million. Prices of each have recently been reduced.

NEW ANTIBIOTICS

Chloromycetin and Aureomycin grow in usefulness as increased clinical experience expands their fields of application. The former can now be manufactured synthetically, while Aureomycin, a more complex molecule, must still be produced by fermentation. Bacitracin's use so far, due to relatively high toxicity, has been limited to topical application for the treatment of infections; however, new evidence of its activity against the organism causing amebic dysentery will justify further study. Any enthusiasm for Neomycin is still dampened by its high toxicity. The challenging field of antibiotic research continues to bear new fruit and recently brought forth Terramycin, an antibiotic therapeutically resembling Aureomycin.

TUBERCULOSIS

Streptomycin remains as the most widely used agent for the treatment of tuberculosis. The predicted advantages of dihydrostreptomycin have not been generally realized and its acceptance is less than anticipated. However, PASA (para-aminosalicylic acid and its sodium salt) when given in large doses concurrently with streptomycin, provides a more effective form of treatment and apparently delays significantly the development of tubercle bacilli resistant strains.

A newer German drug, Tibione or TB-1, para-formylacetanilide thiosemicarbazone, received much publicity last year. Although it may be fairly effective in pulmonary tuberculosis, more complete evaluation of Tibione in this country has demonstrated rather serious toxic effects, making its future very questionable.

ANTIHISTAMINICS

Some fifteen antihistaminics appeared on the market in more than fifteen different products, and much interest centered around their possible use for the prevention and treatment of the common cold. The controversy over this question reached a peak when many of the antihistaminics, heavily advertised, were offered for sale without prescription. Action against certain of these by the Federal Trade Commission late in the year resulted in modified advertising and curtailed promotion. From continued research for new antihistaminics emerged less sedative products, and some with more prolonged action free from undesirable side effects. Antihistaminics continue to be of value for a number of allergic conditions. It has also been found that certain of them are useful for the prevention of motion sickness.

VITAMINS

A noteworthy advance came with the commercial synthetic production of vitamin A. This accomplishment may, to a significant extent, displace the natural vitamin from the market.

Vitamin B_{12}, the most active known therapeutic agent, became established as the true anti-pernicious anemia factor and as an important component of the animal protein factor complex. It was soon learned that other B_{12} vitamins exist. Vitamin $B_{12}b$, a form of equal therapeutic activity, also manufactured by fermentation, can be obtained in the laboratory by the catalytic reduction of B_{12} or by treatment with sodium bisulfite. Further chemical study of this complex molecule of suggested formula, $C_{62\text{-}63}H_{88\text{-}90}N_{14}O_{13}PCo$, continues in order to more completely elucidate its structure. Clinically it is known that vitamin B_{12}, although inactive orally in the P.A. patient, becomes active by mouth when given with normal gastric juice. Progress is being made in the isolation of this intrinsic factor from animal stomach lining.

Further stimulus for increased commercial production of B_{12} resulted from the recent discovery of its growth-promoting properties. When given concurrently with Aureomycin to chickens and other animals, remarkable growth acceleration is achieved; similar results have been noted when 10 micrograms per day of B_{12} alone are added to the diet of undernourished children.

OTHER DEVELOPMENTS

A boon to the diabetic and obese patient came with the development of a new synthetic, non-caloric sweetening agent, Sucaryl (sodium cyclohexylsulfamate). With this heat-stable sweetener, the diabetic can for the first time have such foods as jams and jellies, canned fruits, bakery goods, and candies sweetened during the cooking. Sucaryl Sodium, some 30 to 50 times as sweet as sugar, has the added advantage over saccharin of giving no bitter aftertaste except in high concentrations.

For arthritis and related disorders, several of the simpler sterols (without an oxygen atom in the 11-position) were marketed, but their real value is debatable. ACTH and cortisone still head the list, although because of undesirable side effects produced, their employment must be well-regulated and limited.

Recent synthetics, Artane, Parpanit, and Diparcol for Parkinson's disease and Banthine as an anti-gastric secretory agent for ulcer patients will require further study for determining their real value. New dicumarol analogs under current investigation may prove to have advantages as improved anticoagulants.

Future research trends lie in the fields of hypertension, cancer, cardiovascularrenal diseases, immunology, arthritis, nerve and mental diseases, and virus diseases where efforts are being emphasized by increased funds from both private and public sources. Each year's research brings new accomplishments and makes definite, though often seemingly small progress in these most difficult problems. The industry looks forward with hope to their eventual solution.

NAVAL STORES

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THE past naval stores season (April 1, 1949—March 31, 1950) has been a memorable one in several respects.

The announcement in late November of a proposed loan value based on 60% parity for the season beginning March 31, 1950, caused producers of gum rosin and turpentine to place as much of these products as possible under the existing government loan before the deadline of December 31, 1950. This caused a temporary shortage of gum rosin and turpentine and maintained prices at about the loan value for the remainder of the season. As a result of this situation, Government stocks of gum rosin and turpentine on March 31, 1950, were higher than at the end of the 1949 season.

Since March 31, 1950, prices of rosin have been declining toward the new loan values, but turpentine has remained quite steady and close to the loan value of 40 cents per gallon. Industry predictions are that rosin prices will fall to near loan values in July and strengthen somewhat during early fall.

EXPORTS RISE

Production of gum rosin and turpentine was approximately the same as in the previous year, while production of wood rosin was 5% lower and wood turpentine, 5% higher. Government figures indicate that wood rosin production exceeded gum rosin production by 175,000 drums and wood turpentine exceeded gum turpentine production by about 27,000 barrels. Stocks on hand on April 1, 1950 were: gum rosin, 802,600 drums; wood rosin, 91,600 drums; gum turpentine, 124,660 barrels; and wood turpentine, 81,300 barrels. Domestic consumption of rosin was slightly lower than during the previous season, but domestic consumption of turpentine was slightly higher. Exports of both rosin and turpentine showed a healthy increase during this period.

The use of rosin in soap, synthetic resins, chemicals, linoleum, paint and varnish continued to decline, probably reflecting the increased use of tall oil as a replacement for both rosin and fatty oils in these industries. Progress has been made on the commercial development of synthetic detergents based on reacting tall oil or rosin with ethylene oxide. Some of these products are now in commercial production and may recapture some of the loss of rosin business in the soap industry. A considerable volume of rosin and tall oil esters is being used in the manufacture of special lubricants. Production of "Abitol," an alcohol made from rosin, has reached commercial stage and this new product is finding use in lubricants, plasticizers, resins and specialty products in increasing volume.

A process for making maleopimaric acid by reacting maleic anhydride with pine oleoresin has reached pilot plant stage at the Olustee, Ga., Naval Stores Experiment Station. This new product has interesting commercial possibilities.

Application has been made to the Secretary of Agriculture for the establishment of rosin derived from tall oil as a new type of rosin under the Naval Stores Act. This matter is now being considered by the Secretary following a hearing in May of this year.

ROSIN AMINE

A primary amine made from rosin has now reached commercial production. It is finding expanding use in many diversified fields including algaecides, germicides, flotation, asphalt additives, corrosion inhibitors, wetting agents, fungicides, preservatives, and as a chemical intermediate.

Turpentine, as in former years, finds its greatest market in retail sales as a paint thinner. However, use of turpentine as a chemical has shown a marked increase largely as a result of the growth of chlorinated camphene as an insecticide. Large quantities of α-pinene derived from turpentine are being consumed by manufacturers of oil additives. Also, considerable quantities of monocyclic terpenes are being used as raw materials for the manufacture of oil additives.

A new type of terpene polymer resin made from reaction of pinene with phenol is reported to be in commercial production. This pale-colored, neutral, alcohol-soluble resin is reported to find commercial use in paper coatings and special adhesives.

Commercial production of *p*-cymene from terpenes is forecast for 1951.

Pine oil continues to enjoy wide use in flotation, disinfectants, industrial detergents, textile chemicals and specialty products. The supply situation has changed from a plentiful supply during the early part of 1949 to a very tight situation at the present time.

Monocyclic terpenes are in good supply and this situation is expected to continue for the balance of the year. Rubber reclaiming is taking large quantities of these terpenes as a result of a boom in rubber reclaiming caused by the high price of natural rubber. The use of monocyclic terpenes for the production of oil additives is growing and may be considered one of the important outlets for these naval stores products. Projected new chemical uses are expected to consume present excess production.

TALL OIL

The growing utilization of resin acids and fatty acids derived from tall oil is worthy of comment. Considerable progress has been made in the refining and separation of these products from crude tall oil. Refined tall oil is finding extensive use for the manufacture of alkyd resins, soap, linoleum, synthetic detergents and emulsifying agents. Fatty acids derived from tall oil are being converted into esters which are useful as plasticizers, resins, and chemicals. As mentioned previously, rosin derived from tall oil is now being offered by one of the large refiners of tall oil.

There is a growing tendency for producers of both gum and wood rosin to manufacture rosin esters, maleic-modified and phenol-modified rosin esters, metallic resinates, gloss oils, and other specialties made from rosin. Also, several of the large producers of wood naval stores have

installed equipment for refining and chemical processing of crude sulfate turpentine to produce terpineols, terpin hydrate, synthetic pine oil, and α- and β-pinene. A large share of the crude sulfate produced is being utilized in this manner.

POLYMERS

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IMPORTANT progress was made during the last year in the synthesis of high-softening polymers, which are equally important in the plastics field for insulation and coating and in the fiber field for various textile uses.

Polytetrafluoroethylene (Teflon) is known to be an outstanding material as far as heat distortion and electrical properties are concerned. One drawback was its poor adhesion to metals, glass, fabrics and paper. It has now been found that Teflon emulsions containing a small amount of very finely dispersed silica adhere satisfactorily to all types of surfaces. Another high-melting plastic with excellent electrical properties is polytrifluorochloroethylene (Kel-F), which is now being produced in several grades having different molecular weights. Copolymers of styrene and other hardening monomers such as fumaronitrile, acrylonitrile, and methylenemalononitrile have now been developed for injection and compression molding; they show improved heat distortion and solvent resistant properties. Improvements in the preparation and application of simple silicone resins, and improved procedures for the introduction of various alkyl and aryl groups, have led to limited but expanded use of these interesting materials for coatings and lubricants.

Modified nylons with a remarkable degree of rubber-like elasticity are made by reducing the lateral molar cohesion of the chains through replacement of the active hydrogen atoms by alkyl groups; polycaprolactam is being made by a continuous process of great simplicity and leads to fibers, monofils and ribbons of excellent properties. Other outstanding fiber and film formers are polyglycolterephthalate (Terylene) and other polyesters and polyamides containing aromatic components. Polyacrylonitrile fibers, such as Orlon and Chemstrand, represent a combination of many interesting properties; the difficult dyeing of such materials has been to a large extent overcome either by copolymerization with basic monomers or by the introduction of hydroxyl groups.

An entirely new type of polyhydrocarbon was prepared by high-temperature dehydrogenation of methylated aromatics such as *p*-xylene, dimethylpyrazine and the like. High-melting and difficultly-soluble resins are obtained which, according to their X-ray patterns and infrared absorption curves, are essentially unbranched chains of molecular weights above 100,000.

Combinations of various polycondensation products with Vistra and viscose rayon have improved the crease resistance and the dimensional stability of fabrics made from these fibers to a considerable extent. Improvements in chemical processes for treating wool, have improved its stability to alkaline washing.

New types of snappy and extremely tear-resistant rubbers have been obtained by crosslinking polyesters with diisocyanates.

NEW METHODS

An important step was achieved in the preparation of vinyl-type polymers by introducing certain aliphatic azo compounds as radical-producing initiators. Some of these substances are more convenient to handle than peroxide, permit the reaction to start at a lower temperature, and do not introduce any oxygen or oxygen-containing groups into the polymer.

New and improved initiating systems of the "redox" type have been developed for the production of "cold rubber"; they convert around 5-15% per hour at 0°C and lead to a product which represents a very desirable compromise of properties. Processed into tires, these rubbers are far superior to standard GR-S and compare favorably even with the best natural rubber stocks.

Interesting progress was also made in methods for investigating structure and properties of macromolecules in solution and in the bulk phase. Use of polarized infrared radiation not only establishes the existence of a certain group, such as CO and OH in a given material, but also makes it possible to study the geometrical arrangement of these groups in respect to the backbone chain of the polymer. The light-scattering method has been further developed; better instruments have been constructed, more reliable methods of calibration have been devised, and more effective means for the purification of polymer solutions have been developed.

Very strong sources of ultraviolet light ("flashes") and neutrons have been successfully used to initiate polymerization; radioactive isotopes have been applied to study the reactivity, diffusibility and molecular weight of various polymers.

COAL-TAR CHEMICALS

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INCREASED demands for coal-tar chemicals were experienced after the decline in the first half of 1949. The supply - demand situation was further aggravated by coal and steel strikes in 1949 and the coal strike in 1950. At year's end benzene, toluene, and xylene in particular were in very active demand and plants were having difficulty in meeting requirements. Shortages of some intermediates were also reported, particularly phthalic anhydride, which was in very great demand in the second half of 1949. Demand for many coal-tar chemicals and intermediates has remained firm during the first half of 1950, but few acute shortages have arisen in the second quarter with the possible exception of benzene.

NEW CHEMICALS

A large number of new chemicals was introduced during the past year. New phenolic compounds and derivatives include *p*-benzylphenol, *p*-cresyl benzoate, *m*- and *p*-aminophenols, octylcresol, and 4-4'-isopropylidenebis-(2-isopropylphenol). *o*-Chlorocinnamic acid, anisic acid and anisoyl chloride are in pilot-plant production. Acenaphthylene is available in research quantities, tetrahydrophthalimide in pilot-plant quantities, and *m*-benzenedisulfonic acid is now produced in commercial quantities. Benzilic acid, benzil, and benzoin are new chemicals of commerce. Allyldiphenylacetic acid, methallyldiphenylacetic acid, and *p,p'*-dioctyldiphenylamine are being offered in limited quantities. The compounds, 2-nitrodiphenylamine, N-cyclohexyl-2-benzothiazole, 2,4-dinitrobenzenesulfenyl chloride, 2,3,5-triphenyltetrazolium chloride, *tert*-butylbenzoic acid, and 5-iodo-2,4-dichlorophenoxyacetic

acid are of recent commercial origin. Dinonyl phthalate and *p*-hydroxydiphenylamine are also new chemicals. Maleic anhydride is now available in briquette form.

PEST-CONTROL AGENTS

The market for pest-control agents became very active in 1949 after meeting serious reverses in 1948. This increase was due largely to high insect infestations and low inventories of pest-control agents. DDT production staged a remarkable comeback, increasing 90 percent in 1949 as compared with 1948.

N-arylphthalamic acids and maleic hydrazide are said to be growth regulators. Compound 42, 3-(1-phenyl-2-acetylethyl)-4-hydroxycoumarin, is a new rodenticide while 2,4,5-trichlorophenyl acetate is a new seed disinfectant. N-butylacetanilide shows promise as a tick repellent, and 8-hydroxyquinoline benzoate is said to be useful in fighting water-borne diseases of pump-fed greenhouse crops. Commercial defoliation of a large number of plants is said to be possible through the use of 2,6-endoxohydrophthalates and similar compounds. The compound, 2,4-dichlorobenzylnicotinium chloride is also a new growth regulator. Aldrin, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene and Dieldrin, 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4,5-8-dimethanonaphthalene are said to be very potent new insecticides.

MEDICINALS

One of the outstanding developments in this field is the wide-spread use of antihistamines in the treatment of colds. Some of these drugs use pyridine in their preparation. The compound 5-(*p*-sulfophenylazo)-salicylic acid is also said to relieve head cold symptoms. Phenacetyl urea is useful in the treatment of epilepsies. β-Dimethylaminoethylbenzhydryl is reported to be highly effective as an air-sickness remedy and 4-acetylaminobenzaldehyde thiosemicarbazone is said to be useful in the treatment of tuberculosis. Equilin, a hormone, is being produced from 1-naphthylamine-6-sulfonic acid. It is said to be the only steroid hormone which can be commercially synthesized directly from coal-tar chemicals.

VINYL COMPOUNDS

Styrene, the principal coal-tar-derived vinyl compound, was in active demand during the past twelve months. Increased sales for polystyrene highlighted the demand for styrene in 1949. In the first six months of 1950, increased amounts were required for polystyrene as well as for synthetic rubber. Enlarged world demand for rubber and uncertainties in natural-rubber producing areas have brought about the need for larger quantities of styrene-containing GR-S rubber. Substantial amounts of styrene were also utilized in butadiene-styrene latices for paints, floor waxes and other uses. Ion-exchange resins, floor tile, and polyester resins have also accounted for part of the increased usage of styrene. New polystyrenes with increased heat and impact resistance were also introduced during the past year.

AROMATICS FROM ALIPHATICS

The shortage of benzene from coal tar, resulting not only from the effects of the coal strike but also from increasing requirements for styrene, phenol, and other products from benzene, has made an actuality of the long-discussed production of benzene from petroleum, although at a significantly higher price than coal-tar benzene. The cyclohexane and methylcyclopentane present in certain crudes are converted to benzene in hydroforming equipment, first used during the war for making toluene. It is estimated that the maximum benzene available from present facilities is only 12 million gallons a year. However, if the oil companies can obtain sufficient commitments at an attractive price (probably over 35¢ per gallon) to justify the investment in additional equipment, it seems likely that the petroleum industry can double the present benzene production from coal tar.

Another aromatic chemical that may be produced from aliphatics is 2-picoline, from which 2-vinylpyridine is manufactured. If the demand for the latter becomes large, the picoline would be produced from acetaldehyde and ammonia because of the limitation on picoline supply from coal tar.

INORGANIC CHEMICALS

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THE fertilizer group of inorganics has shown the greatest activity during the past year. Of greatest technical interest is the announcement of the Potash Corp. of America that it will build at Dumas, Texas, a $750,000 plant for the manufacture of potassium sulfate, sodium sulfate and hydrochloric acid. The plant will use the Hargreaves process or a modern modification of it. The process depends on the reaction

$$2NaCl + SO_2 + H_2O + \tfrac{1}{2} O_2 \rightarrow Na_2SO_4 + 2\ HCl$$

in which sulfur dioxide, steam, and air are blown through solid sodium, or potassium, chloride to produce the sulfate and hydrogen chloride. The Hargreaves process was used extensively during the hey-day of the Leblanc process, but in recent years only one plant in this country operated the process. The sulfur used will be petrochemical sulfur recovered from West Texas sour natural gas by the Sid Richardson Carbon Co. Reactivation of this old process using modern materials of construction and methods for handling solids is an excellent example of the cycle of technology in which the old becomes new through advances elsewhere in engineering and technology. The Dumas plant is expected to be in operation by Jan. 1, 1951, and it will be observed with interest by others who may desire to produce sodium sulfate without the direct use of sulfuric acid.

The potash industry has been sufficiently successful to attract additional companies to the Carlsbad area. Duval Sulfur Co. recently became the Duval Sulfur and Potash Co. and will build a $7.5-million plant for the mining and processing of 720,000 tons per year of potash. The flotation process will be used to separate potassium chloride from sodium chloride. Southeast Potash Co., a subsidiary of American Metals Co., will also mine and process potash. The underground solution process tried on a small scale by Continental Potash Co. has apparently been unsuccessful, as the new operators will use shaft mining methods. Freeport Sulfur Co. has not yet announced its plans for potash development.

PHOSPHORUS EXPANSION

Expansion of phosphorus and phosphate production has extended from the Atlantic to the Pacific. Increasing demands for fertilizer and increasing utilization of phosphate detergents and chemicals have forced all major producers to expand their facilities.

International Minerals and Chemical Corp., always a larger producer of phosphates for fertilizers, is increasing and diversifying its production. In its Florida phosphate fields International will erect a $4-million plant for superphosphate and phosphate chemicals; included in the construction will be a new sulfuric acid plant. The principal chemical will be dicalcium phosphate for both stock foods and chemical uses.

Another new Eastern plant is that of Virginia-Carolina Chemical Corp., at Charleston, S. C.

Monsanto Chemical Co. will erect a new electric furnace at its Tennessee plant for the production of elemental phosphorus. This furnace, its sixth at this plant, will be the largest phosphorus furnace in the world and will have a capacity of 25,000 kilowatts. The yellow phosphorus will be transported by tank car to processing plants which are being expanded at Trenton, Mich., and Carondelet, Mo. The former plant produces mainly soluble phosphates for the detergent industry, while the latter also produces calcium phosphates. At Monsanto, Tenn., the company has installed a plant to absorb all fluorine-containing gases from the furnace gases in order to eliminate fluorosis in the neighborhood of the plant. At present the calcium fluoride formed is sent to a waste pond, but wastes habitually become raw materials for later processing.

Westvaco Chemical Division of Food Machinery and Chemical Corp. is already expanding its furnace capacity at Pocatello, Idaho, by the addition of a third furnace. Additional capacity is being provided at the Newark, Cal., plant to produce phosphate chemicals. A new $3.5-million plant at Lawrence, Kan., will be constructed to take care of the demand for phosphates in the mid-western and mountain states.

The Pacific Northwest will have its own $400,000 plant at Cascade Locks, Ore., where the Columbia Electro-Chemical Phosphate Co. will operate a 5,000-kilowatt furnace for phosphorus to be oxidized to phosphoric acid for the manufacture of triple superphosphate. Phosphate rock needed will be brought from Montana. At Tacoma, Wash., Stauffer Chemical Co. will use part of the sulfuric acid from the new plant at the A. S. & R. smelter to produce an estimated 35,000 tons per year of superphosphate.

NITROGEN USES INCREASE

The new synthetic ammonia plants in Texas, announced last year by Dow and Du Pont, are both under construction and should be in operation late this year. The former plant will operate on by-product hydrogen from caustic-chlorine cells, whereas the latter will use natural gas as the hydrogen source. Mathieson Chemical Corp. at Lake Charles, La., is increasing its ammonia capacity by utilizing the hitherto wasted hydrogen from the adjacent caustic-chlorine plant of Southern Alkali Corp. The Phillips Petroleum Co. subsidiary, Phillips Chemical Co., has expanded the Cactus Ordnance Works ammonia plant purchased from the government near Etter, Texas. Ammonia capacity has been doubled from 70,000 to 140,000 tons per year, largely to produce ammonium sulfate at the Port Adams plant on the Houston ship channel. Ammonia oxidation units have been installed for nitric acid production, which will allow ammonium nitrate production both as solid and solution.

Spencer Chemical Co., Pittsburg, Kan., has increased its ammonia capacity by the purchase of more government plants: the Ohio River Ordnance Works at Henderson, Ohio, and parts of the Indiana Arsenal at Charlestown, Ind. The former installation has a 56,000 tons-per-year ammonia plant, while the latter has a nitric acid and ammonium nitrate plant. Both solid ammonium nitrate and Spensol, an ammonia-ammonium nitrate solution, will be produced. Lion Chemical Co. at El Dorado, Ark., another ex-ordnance plant, has completed its expansion of ammonium sulfate and nitrate facilities. It is the first in this country to operate the Canadian prilling process on ammonium nitrate.

A new market for ammonia may develop if the plant-scale experiments on ammonium bisulfite pulping are successful. Because the ammonia-base liquor can be concentrated and burned without the scale and residue difficulties encountered with calcium-base liquor, ammonia may be used at those mills forced to solve the pollution problem. Crown-Zellerbach Corp. and Soundview Pulp Co. are cooperating in these experiments by operating the C-Z mill at Lebanon, Ore., with ammonia-base liquor. This solution to the pollution difficulties in which the sulfite mills find themselves is a potential competitor of the magnesium-base liquor process now being operated by Weyerhaeuser at Longview, Wash. The economies of the two processes eventually will be proved and will be the deciding factor. If ammonia should win, new production facilities would be needed in the Pacific Northwest and in the Northern Midwest and Northeastern states.

The small operator now takes an increased interest in ammonia oxidation when he finds that it may be economical for him to produce as little as one ton per day of nitric acid in his own oxidation plant. Knecht (*C. I., March 1950, p. 357*) described such a plant in operation at the Ames Chemical Works.

Nitrogen tetroxide, N_2O_4, may be an oxidizing agent in rockets because of the 70% oxygen contained in it and of the rapidity with which the oxygen can be released. If this should be teamed with hydrazine, N_2H_4, likewise produced from ammonia, production facilities would have to be increased markedly for any further defense purposes.

That barometer of industrial activity, sulfuric acid, is hitting new highs. For several months in 1950 new acid production topped a million tons per month, setting new records monthly. Output was divided about 25% to the chamber process and 75% to the contact process. Most new plants announced have been associated with fertilizer developments, either superphosphate or synthetic ammonium sulfate. The latter compound has also hit new highs in its 1950 production.

With estimates of commercial sulfur reserves now placed at about 25 years, there is a reappraisal of sour natural gas as a source of sulfur. An estimate has been made that 400 tons per day of sulfur are available in the sour gas of the Permian Basin in West Texas and New Mexico. Concentrations are low in comparison with the 20% hydrogen sulfide present in some Wyoming gas that is being processed by Texas Gulf Sulphur Co. and by Stanolind Oil and Gas Co. The gas must be sweetened before it can be piped for domestic use, and modern concentration plants give a high concentration gas that can be oxidized readily to sulfur. Although markets do not exist at present for the sulfur, future need for acid and fertilizers may bring chemical industry to these raw materials.

Additional sulfur is going to carbon bisulfide to supply the growing cellulose xanthate industry producing rayon and cellophane. Stauffer Chemical Co., at Lowlands, Tenn., is constructing a $1-million plant using the conventional furnace process. No reports have been issued by Barium Reduction Corp. concerning its Pure Oil Co. process which reacts methane and sulfur vapor to produce both carbon bisulfide and hydrogen sulfide.

ALKALI AND CHLORINE

Expanding needs for chlorine bring increasing supplies of sodium hydroxide which apparently are being marketed readily enough at present. Interest continues in the mercury cell for the direct production of caustic solutions up to 73%. Monsanto Chemical Co. is making an installation of the deNora cell in its Illinois plant. Monsanto are sales and installation engineers for this Italian cell, which is now in operation in other plants in the country. Mathieson has continued to push its cell and has turned over to Blaw-Knox Co. its stationary mercury cell for sales and installation. It undoubtedly will be used in the new $6-million plant at Saltville, Va., for Mathieson Hydrocarbon Chemical Corp. This new venture will put Mathieson in the aliphatic chemicals business.

Considerable expansion is being

made in existing plants. Dow is increasing its installation at Velasco, Texas (Plant B), to give more chlorine for vinyl and vinylidene chlorides. Although this plant, the old Dow Magnesium Corp. plant, was originally equipped with Hooker-S cells, the new ones will be the semi-secret Dow cell in which the company apparently reposes great faith. Hydrogen from all the electrolytic cells will be used in the new ammonia plant. Hooker Electrochemical Co. is expanding its plant at Tacoma, Wash., naturally enough using its new Hooker S-3 cell.

National Distillers Chemical Corp., at Ashtabula, Ohio, is now in operation with its metallic sodium-chlorine plant. Full-page advertisements announce the availability of sodium, but apparently the chlorine has taken care of itself.

A serious disadvantage of most chlorination reactions is that half of the chlorine ends up as hydrochloric acid. The Deacon process operated for years on waste hydrogen chloride but disappeared after electrolytic chlorine became cheap and plentiful. Considerable interest has been reawakened in the Deacon process using modern methods and cheap industrial oxygen. Another attack on the problem is Westvaco's process for the electrolysis of hydrochloric acid to chlorine. This process (*CI, April 1950, p. 501*) uses cupric chloride as the intermediate carrier to give chlorine and cuprous chloride, which is reoxidized with air in a hydrochloric acid solution. Low energy requirements make this appear to be a promising method.

While companies worry about the cost of new soda and installation, Nature provides. However, Nature is not considerate of demand and of users' location, for she provided a gusher of 10,000 barrels per day of a 5% solution of trona in southwestern Wyoming. Sodium carbonate can be crystallized from the solution. In an adjacent area Westvaco Chemical Division mines trona found in a deposit 1500 feet deep. Calcination of trona gives a natural soda ash.

Fluorochemicals continue to gain in importance. Fluorine for organic reaction still is produced in small quantities. Of greater importance is hydrofluoric acid. Pennsylvania Salt Manufacturing Co. recently opened its new $2-million plant for sulfuric and hydrofluoric acids at Calvert City, Ky. Banking on future chemical growth in this area, the company purchased a 540-acre site. Aluminum Ore Co. has installed a fluoride plant at its East St. Louis factory to produce sodium fluorides and hydrofluoric acid from fluorspar found at Rosiclare, Ill.

Magnesia for wood-pulping created quite a stir when Weyerhaeuser announced that its new plant at Longview, Wash., would operate as a closed system with recovery of the magnesia and sulfur dioxide. Here at last was a solution to stream pollution by sulfite waste liquor. Operating difficulties in the new mill kept recoveries low, and other mills became skeptical. Crown-Zellerbach and Soundview combined to try ammonia base pulping, as had Rayonier previously. New figures released as a result of a recent survey (*Pulp and Paper*, June 1950, p. 39) show the comparison of what is now economically attainable, after some modification, in comparison with operations last year.

	Aug. 16-22, 1949	*Mar. 9-18 1950*
Sulfur recovery, %	64	70
MgO recovery, %	74	88
	Aug. 16-22, 1949	*Mar. 9-18, 1950*
Usage per ton of pulp:		
Makeup sulfur, lbs.	103	71
Makeup magnesia, lbs. (pure MgO, lbs.)	49 44	20 18
Steam at 620 psi and 715°F., lbs.	6845	9000

Further improvement will depend on the pulp washing equipment and gas recovery system rather than the chemical recovery system.

PERIODIC TABLE

Oxygen in tonnage quantities continues to provoke discussion. McCarthy says that his oxygen plant operated satisfactorily, but others say its difficulties contributed to the demise of his chemical company. The 1,000 ton-per-day plant of Carthage Hydrocol will be the last word in the argument regarding operation and costs.

Increasing sodium availability has made sodium hydride and sodium amide available in commercial quantities for organic syntheses.

Lithium metal and its compounds are in increased supply because of plant expansion by Metalloy Corp., Foote Mineral Co., and Metal Hydrides, Inc.

Metallic cobalt will become a more common commodity following completion of a 2 million pounds-per-year refinery by Howe Sound Co. in Utah.

Magnesium may take over from zinc for dry battery manufacture; the new cell has about twice the capacity of the zinc cell.

Beryllium is now produced by Brush Beryllium Co. at Luckey, Ohio, at a war-time magnesium plant. The metal is used as a moderator in the atomic pile.

Titanium continues to pop up in the news from various parts of the continent. National Lead Co. will produce it at the old Basic Magnesium plant in Henderson, Nev. Kennicott Copper Co. and New Jersey Zinc Co. will operate an ilmenite mine in eastern Quebec for production of titanium oxide slag for processing to the dioxide pigment. Increasing importance of the metal itself is due to new alloys with desirable properties which have been developed for the Navy. Increased interest for alloys and pigments will produce greater interest in chemical compounds.

Petroleum cracking may not be a phase of inorganic chemicals, but catalysts for the purpose are. Filtrol Corp. will build a $2.5-million plant in the Utah-Nevada region. National Aluminate Corp. in Chicago will double the size of its catalyst plant. American Cyanamid Co. will begin construction in East Chicago of a $3-million plant for the production of synthetic cracking catalyst for the mid-west petroleum industry. Davison Chemical Corp. will spend $1,250,000 to expand their synthetic catalyst plant in Cincinnati.

DYES

by BYRON L. WEST
American Cyanamid Company
Calco Chemical Division

BUSINESS in the American dye industry should continue to be good during the rest of this year.

One cloud is on the horizon: the announced intention of the State Department to include intermediates in the Torquay negotiations for possible tariff reductions. Such reductions coupled with the possibility of the adoption of foreign export price as a basis for duty instead of American selling price, on top of the recent wholesale currency devaluations, would be a staggering blow to the American dye industry.

Large and small American producers have appeared before the Committee on Reciprocity Information to point out that the small amount of dollars foreign countries would gain by the Administration's policy would be insignificant compared to the damage that could ensue to an industry so uniquely vital to our country in peace and war.

FUNDAMENTAL STUDIES

The well-attended Harrogate symposium on photo-chemistry in relation to textiles, presented 26 papers *(1)*, several of which were from overseas.

In America we have emphasized more the photodegradation of the dyes than that of the fiber. In England they are more fiber conscious. The funda-

mental and applied research reported showed more clearly than ever before that all fibers are subject to photodegradation. The tendering effect of certain dyes is now much better appreciated than before; on the other hand, it was disclosed, in some cases, that the dyes often protected the fiber from degradation.

Kuhn *(2)* reported further progress on the expansion of the quantum mechanical theory of light absorption of organic dyes and similar compounds. This concept, based on an electron gas model, gives a more quantitative approach than the resonance theory does.

P. Alexander *(3)* presented the fundamentals of wool dyeing and clearly explained why the gegen-ion, or chemical theory of acid dyeing, depending on the anion affinity of the dye for the wool, fails to explain the affinity of milling dyes for wool. These appear to dye wool in a manner similar to that of direct dyes on cotton and depend on dispersion forces, surface activity and hydrogen bonding.

Lipson and Speakman *(4)* produced preferential internal polymerization of wool by means of ferrous ammonium sulfate and subsequent treatment with methacrylic acid containing a trace of hydrogen peroxide. They postulated that such reactions should be useful in strengthening fibers and repairing damaged fibers. Capp and Speakman *(5a)* obtained appreciable reduction in milling shrinkage of wool through crosslinking brought about by the reaction of salt linkages with the carboxyl groups.

Farnsworth *et al. (5)* concluded from their experiments on protecting the sulfur linkage in wool that chlorine, sulfuryl chloride, and caustic soda make wool unshrinkable by promoting the breakdown of the disulfide bond in the surface of the fibers. He obtained complete immunity to the reaction of chlorine, sulfuryl chloride, and caustic potash with wool treated with KCN, which converted most of cystine linkages into lanthionine.

Knight wrote reviews *(6, 7)* on recent trends in new wool and acetate dyes that disclosed considerable information on the constitution of the dyes.

SPECTROPHOTOMETRIC INSTRUMENTS

A new instrument for precise color matching, the "Color Eye," is on the market. It is said to employ a combined electronic and optical computing system to simulate the response sensitivity of the human eye without the eye's variation in perception. It automatically accommodates itself to the level of illumination and its sensitivity exceeds that of the human eye for variations in brightness of 10,000 to 1. It evaluates tristimulus values relative to standard white and has a direct reading scale of 0 to 100%.

A new book "Analytical Absorption Spectroscopy" edited by M. G. Mellon *(8)* is of interest as the first comprehensive study of the fundamentals, methods and apparatus involved in the analytical application of the absorption of radiant energy in the ultraviolet, visible and infrared spectral regions.

ANTHRAQUINONE DYES

During the past year interest has continued in the use of anthraquinone derivatives as acetate dyes as evidenced by the large number of patents in this field. Derivatives of 1,4-diaminoanthraquinone containing a halogen in the 2-position have been claimed to exhibit outstanding light fastness. New blue acetate dyes, condensation products of primary amines with dinitrodihydroxyanthraquinone, have been claimed. In this field an interesting reaction is described: 1-Amino-2-sulfo-4-alkylaminoanthraquinones are reacted with sodium cyanide to give the corresponding 2,3-dicyanoanthraquinones which are used as acetate dyes; hydrolysis of the amino group furnishes further new dyes. Amides containing a free carboxyl group obtained by the reaction of dibasic acid anhydrides, such as phthalic anhydride, with a polyaminoanthraquinone have been claimed to give good shades on acetate.

Wool dyes derived from bromamine acid by replacing the bromine atom with an *o*-hydroxyarylamine have been described as producing gray shades after metallization. New blue wool dyes obtained from 1-amino-2-*tert*-butyl-4-bromoanthraquinone by reaction with *p*-toluidine and sulfonating have been described in academic papers.

The continued trend toward the use of faster dyes for cellulosic materials is reflected in the usual large number of patents on new vat dyes. Apparently the potential availability of thiophene following the war stimulated great interest in vat dyes derived from this intermediate. Various analogues of anthraquinone containing the thiophene ring have been patented and these analogues have been built up into various polynuclear vat dyes. For example, the thiophene analogue of Vat Olive Green B has been claimed to have certain superior fastness properties.

Exploitation of the hypsochromic effect of the alkanesulfonyl group continues. Recently issued patents describe anthraquinone-acridone dyes containing this group which give bright, greenish-blue shades. Trianthramidecarbazol dyes containing the benzamido group in various positions have been described as giving olive brown shades, and these products are stated to be especially suitable for conversion to the leuco sulfuric esters. Novel combinations of anthraquinone dyes containing both the acridone and acridine nucleus giving shades ranging from orange to violet have appeared in the patent literature. A new yellow vat dye stated to have outstanding fastness has been introduced and some new members of the class of vat dyes especially suitable for dyeing wool have been offered.

Many improvements or modifications in processes for existing dyes have appeared. For example, a new method for the preparation of Vat Yellow GC has been described in which the synthesis is conducted in phenol, a method which is stated to give much improved yields. Formation of the acridone ring in acridone vat dyes has been accomplished from the intermediate acid chloride by the use of phosphorus oxychloride as catalyst. Further patents have appeared on the formation of finely dispersed vat dyes by treatment with sulfuric acid of a critical concentration.

Continued efforts of the dye industry to produce cheaper and purer intermediates is evidenced by the large number of patents in this field. Recent patents have described the purification of such basic intermediates as α-aminoanthraquinone. In one case the pure compound was obtained from α-chloroanthraquinone through the phthalimide synthesis and in another purification was achieved through the thionylamine derivative. A process for the preparation of 1-chloro-2-carboxy-anthraquinone from the more readily purified 1-nitro-2-carboxy-anthraquinone by reaction with sodium sulfite followed by replacement of the α-sulfonic acid group with chlorine has been described. An interesting synthesis of β-aminoanthraquinone has been achieved through the direct amination of anthraquinone with hydroxylamine, although the yield obtained has thus far been rather low. A very interesting patent has appeared on the preparation of certain α,β-anthrimides containing carboxyl groups by the reaction between an aminoanthraquinone and a chloroanthraquinone catalyzed by aluminum chloride.

Continued interest is shown in the preparation of solubilized forms of vat dyes which can be regenerated on the fiber. Expansion of the well established sulfuric esters of leuco vat dyes continues. New patents have appeared on processes for obtaining these products as well as patents on intermediates in their preparation. While much in-

terest centers on aqueous processes for these products, a novel method has been described in a recent patent which uses dimethylformamide instead of a tertiary base as the reaction medium for an anhydrous process. A new method for the solubilization of vat dyes employs the reaction known as chloromethylation followed by reaction with a tertiary amine or a thioether to yield, respectively, a quaternary ammonium halide or ternary sulfonium halide. Upon mild alkaline steaming these products regenerate an insoluble pigment in the fiber in a manner similar to Alcian Blue 8GS. The commercial possibilities of such a solubilization method are not yet known.

In the field of application two improvements have been introduced during the past year. In one of these processes a reduced form of the dye, for example, the sulfuric ester of the leuco compound is applied to the cloth in the usual manner and then developed by the action of light catalyzed by certain cyanine dyes and radioactive materials. The advantages claimed for this process are higher rates of development, better penetration, and ability to dye and print mixed fibers. A second potentially very important development is the method whereby the leucos of vat dyes can be stabilized at a high temperature. This method should do much to insure the reproducibility of dyeing procedures.

AZO DYES

As usual, there are a number of patents this year covering special combinations of old intermediates. There are several new direct dyes from pyrazolones described. One patent claims the dyes prepared from tetrazotized 3-hydroxy-3′-methoxy-4:4′-diaminodiphenyl coupled with salicylic acid and then with, e.g., 1-(3′-sulfamidophenyl)-3-methyl-5-parazolone; another claims dyes from dipyrazolones: e.g., 1-diazo-6-nitro-2-hydroxynaphthalene-4-sulfonic acid coupled with the urea made from 1-(4′-aminophenyl)-3-methyl-5-pyrazolones; and another claims the yellow azo dyes produced by coupling with pyrazolones the diazo compounds of amines of substantive power which contain a sulfonic acid or a sulfonamido group in the *o*-position to at least one diazo group.

Several new chrome dyes have been described. The coupling of diazotized 2-amino-4-nitrophenol-6-sulfonic acid with N-(7-hydroxy-1-naphthyl)-phthalamic acid produces a bright green with the monochrome process and a greenish black with the afterchrome process. New azo wool dyes are said to be prepared by the coupling of diazotized *o*-aminophenolsulfonic acids with alkyl N-(7-hydroxynaphthyl) carbamates and treating the dye with chromium. Dyes suitable for animal fibers are claimed for sulfobenzoyl esters of *o,o′*-dihydroxy azo dyes. Excellent properties are claimed for dyes from arylpyrazolonesulfonic acids and aminobenzenesulfonamides containing an N-acyl group of 11 or more carbon atoms. Likewise, disazo dyes for coloring animal fibers are claimed as prepared by coupling a diazotized arylamine having a SO_3H group with an acetylated benzene derivative, diazotizing the compound obtained and coupling it with, for example, 1-(2′-chloro-5′-sulfophenyl)-3-methyl-5-pyrazolone.

New coupling components are hydroxybenzimidazoles, such as 2-methyl-3-hydroxybenzimidazole, from which chrome dyes can be made.

A new dye for acetate rayon is claimed and prepared by coupling diazotized 2-cyano-4-nitraniline with N-hydroxyethyl-N-(phenylethyl)-aniline.

AZOICS

Metalliferrous azoic dyes are beginning to appear. Copperization of the pigment from tetrazotized dianisidine coupled with the 2,5-dimethoxyanilide of β-hydroxynaphthoic acid is claimed. Browns shades on cellulose are produced by coupling a bisazo nitroso compound which is a dinitroso derivative of 1,3-bis(3-amino-4-hydroxyphenyl) urea with a diazonium compound in the presence of suitable metallizing agents.

New fast bases appear to be 5-chloro-2,4 dimethoxy-aniline, 6(5)-methoxy-5(6)-acetoacetylamino-2-methylbenzothiazole, and a 2-(2′-methyl-4′-amino-5′-methoxyphenyl)-2,1,3-benzotriazole.

A process for continuous preparation of pigments and lakes has been patented. The process involves the feeding of two solutions into a third vessel where simultaneous diazotization and coupling take place.

PHTHALOCYANINES

A new, greener shade of unsubstituted phthalocyanine blue is on the market. It is the brightest of all the phthalocyanine blues and falls in the Peacock Blue range. Like the red shade blue, it is extremely fast to light, acids, alkalis and heat. In addition it is stable to crystallization in organic solvents and has greatly improved ink characteristics. For use on food and soap labels, poster and display work it finds welcome use. It combines all the good properties of Peacock Blue lake, but is also fast to light.

Two patents believed to cover this product *(9)* have been granted and claim the product and the process for producing a finely-divided, solvent-stable, sulfuric acid-stable, tinctorially strong, halogen-free metal phthalocyanine pigment, by first transforming the pigment into a coarse crystal form using a crystallizing organic liquid, such as xylene or cellulose acetate, then grinding the pigment with a grinding aid.

Another series of patents for the red shade pigment to prevent crystallization and flocculation in organic vehicles has been granted. This is very important in the enamel and lacquer field. These patents claim the use of small quantities of tin phthalocyanine for the prevention of flocculation of the pigment.

Methods of preparation for metal-free phthalocyanine, particularly useful for rubber, are claimed in two patents. They are produced by heating phthalonitrile in trichlorbenzene in the presence of cyclic amines such as cyclohexylamine with and without the use of glycol.

A phthalocyanine sulfur color which dyes cotton a jade green shade fast to light and washing has been disclosed in a recent patent. The dye is produced by oxidizing a copper mercaptophthalocyanine to the disulfide stage.

Quick-drying inks containing phthalocyanine sulfonamides have been disclosed during the past year.

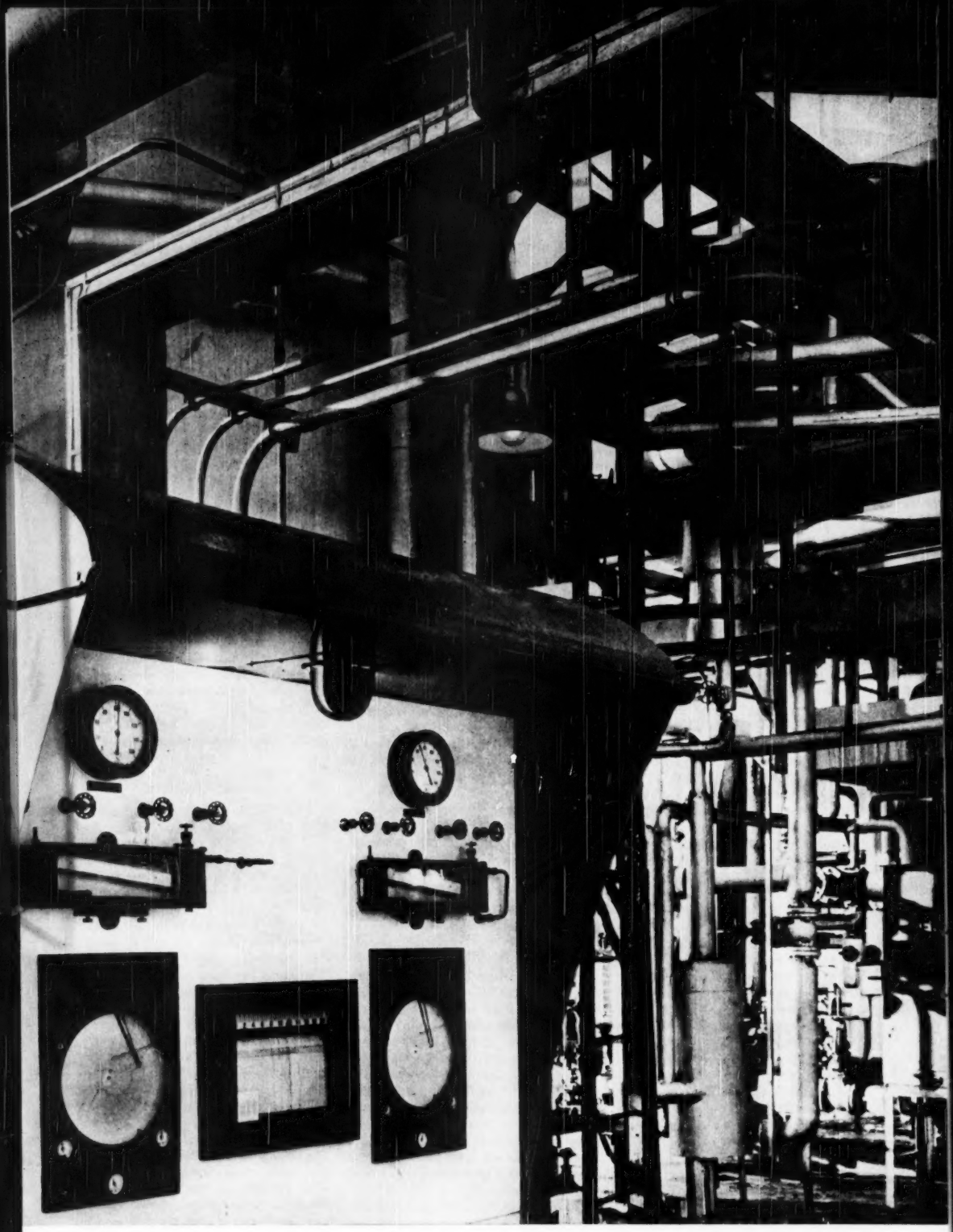
Extremely fast yellower shades of green pigments suitable for enamel and lacquer work have been disclosed as produced by the co-acid pasting or blending of the phthalocyanine pigments with yellow anthraquinone vat dyes.

FLUORESCENT DYES

The "white dyes" or brighteners have gone over very well. These optical bleaches are colorless dyes that fluoresce blue when they are affixed to textile fibers and illuminated with a light source containing ultraviolet light. They impart added whiteness to most off-white products by the double effect of neutralizing the yellow coloration common to most off-whites and increasing the apparent reflectance of white light. In addition they improve the appearance of blues, violets, purples and pinks. They are of especial interest to the soap manufacturer, not only because they are easily incorporated in the soap or detergent but also because the optical bleach is the most efficient method of bleaching for daylight evaluation.

A comprehensive article *(10, 11)* has recently been issued on this subject that includes 22 literature references. The different chemical classes discussed include: (1) coumarin; (2) diaminostilbene; (3) benzimidazole; (4)

(Turn to page 354)



Minneapolis-Honeywell-Brown Dfv.

Instrument console to control flows and record temperatures in furfural extraction unit, Socony Vacuum Oil Co., Paulsboro, N. J.

New Process Equipment To Aid Plant Expansion

6th Annual Survey of NEW CHEMICALS and NEW EQUIPMENT

• Last year process equipment producers had just recuperated from the ulcer-producing days of World War II and days of like shortages which followed. Today after a short period of more normal existence—fewer orders on the books and reduced profits—the young engineer who began his career as World War II started might well ask, "Isn't this where I came in?" It isn't, but these are again hectic times.

Large backlogs of unfinished orders are no longer a thing of the past. The equipment salesman can again suggest a substitute without receiving a withering glance from the customer. It is even rumored that the customer occasionally dives for a luncheon tab.

War, although a small war, is back. Even a small military machine has a seemingly insatiable appetite for chemicals. It's catching too, for when it comes to equipment requirements, chemical producers can't be satisfied either.

WHAT CHANGES are taking place or are going to take place in the application of all types of process equipment? They are many but a few stand out.

Some changes have come about by the normal process of evolution—refinement of existing types. Others, although evolutionary in character, have had an extra push provided by the dire need for something to make a new or improved process operate in a satisfactory manner. Still other changes owe their birth to the realization that nearly all resources, even water supplies, have a strict upper limit on their availability.

WATER SAVERS

The increasing number and growing size of process plants, when combined with the industry's expansion into many water-short areas, have opened a large and rapidly increasing market for water-saving equipment of all types.

Heated water is made suitable for reuse by cooling towers or indirect heat exchange. Air is replacing water as a cooling media where the temperature difference is sufficient. Sea water is being employed as cooling process media in an increasing number of installations.

Another approach to water saving is the integration of water flow within a process plant. Such integration is now being considered a problem of as much importance as the integrated flow of reactant materials. And, such integration means using more instruments and giving more attention to proper plant layout.

The long-term trend toward a higher degree of instrumentation for process control is continuing. Increasing labor costs, emphasis on product quality and now, especially with the Korean War, desire to save manpower in case of a full-fledged conflict, have all combined to promote this trend. For all practical purposes, the plant operator is becoming a maintenance observer in a robotized plant. Cost of providing the necessary instruments for an up-to-date process plant is now approaching the cost of the pipe and fittings.

PIPE AND FITTINGS

Changes in pipe and fittings are slow. However, there is a connected trend toward welded or brazed connections. More recently there has been increasing use of either all-plastic or plastic-lined pipe and fittings for lower temperatures. In particular, Saran for liners and polyethylene for all-plastic systems have been employed because of their excellent resistance to corrosion and solvent deterioration.

Piping is not the only application for the many types of plastics. Teflon with its almost absolute resistance to deterioration has continued to gain approval in difficult gasketing and sealing operations. Even more recent is its application as a corrosion-resistant coating to process vessels. Orlon, Vinyon, and nylon are also available as filter cloths. Latest in plastics is use of resinous ion exchange adsorbers in mixed bed deionization.

CONTINUOUS PROGRESS

Although moving slowly, use of adsorption as a separation technique continues to forge ahead. There are an increasing number of applications of continuous centrifuges. Centrifugal compressors are being more widely employed, particularly at high pressures.

Recent laws against atmospheric pollution, combined with the increasing use of fluidized solids in reactions, have placed emphasis on improvement of dust collection procedures. Sonic equipment appears to be of the greatest importance here.

Many of these major developments were first introduced a number of years ago. Very probably CI's tabulation of the past year's new equipment developments which begins on page 274 contains germs of similar important developments. Process men, while on the lookout for such precursors of tomorrow's standard equipment, may derive even greater value from the array of new modifications, new producers of existing devices, and new construction materials to widen the utility of present types.

Container selection and packaging unit design are important considerations in producing a new material such as Dow's sodium trichloroacetate.

Containers Play Key Role In Chemical Progress

6th Annual Survey of NEW CHEMICALS and NEW EQUIPMENT

• Progress in the chemical industry closely parallels container development. Not only do new chemicals present new packaging problems, but there is a continuing search for materials to package established chemicals more safely, more economically and more attractively.

PAPER CONTAINERS

by T. PAT CALLAHAN, Supervisor of Containers Monsanto Chemical Co.

MISCELLANEOUS packages—multiwall paper bags, fibre drums, and fibre boxes—have played a very prominent role in the packaging of chemicals during the past year and from present indications, these packages will gain in popularity.

Continued use of fibre drums by the chemical industry is anticipated as the fibre drum is the most economical package which can be used for dry and powdered products where freedom from contamination and rigidity is a major requirement. Technological improvements in fibre drum construction and increased activity on the part of manufacturers to produce more and better linings and coatings have made the fibre drum the best container for a growing number of chemicals.

A committee of the Manufacturing Chemists' Association is now working on a program in conjunction with manufacturers of synthetic linings and coatings and drum manufacturers to develop fibre drums for pastes, semi-solids and liquid materials. This program is moving along and it is anticipated that favorable results will be forthcoming so that the fibre drum can be used to ship many commodities heretofore shipped in metal containers.

Continued use of multiwall paper bags for dry and powdered chemicals is anticipated. This flexible container, possessing advantages of economy, is presently being used and will continue to be used in large volumes.

During the past year the application of various synthetic films to kraft paper, particularly polyethylene, has increased the demand for this type of multiwall paper bag, and the coming year should see a further increase in the use of multiwall bags with one sheet coated to permit shipment of various hygroscopic and other chemicals requiring an inert, moisture-proof coating.

FIBRE BOXES

Rectangular fiberboard boxes, capable of holding dry and powdered chemicals, have increased in use during the past year and will increase in the future. The development of extruded plastic bag liners of thin film which can be inserted in these fibre boxes has made them very satisfactory containers for many products. Their light weight and good stacking characteristics due to their construction make them ideal packages. No package lends itself more readily to stacking on pallets than the fibre box and this is a very definite point in its favor. Continued work is being done on the development of larger fibre boxes capable of carrying a thousand pounds or more of dried material.

As pointed out a year ago, containers manufactured from paper are more economical than containers of similar construction manufactured from any other material. All the containers discussed in this article are paper containers and all lend themselves to further improvement by the use of plastic coatings or linings.

GLASS AND WOODEN CONTAINERS

by C. W. BENBURY, Manager, Packaging and Labeling Department Pennsylvania Salt Manufacturing Co.

GLASS container production, which was on a downward trend in 1948 and 1949, made a comeback in the first quarter of this year, it being particularly significant that the heaviest percentage gains were for containers employed in packaging chemicals, household and industrial products. Although numerous applications of plastics in fabricating specialty containers have supplanted some of those formerly made from glass, this apparently has not become a serious threat to the glass container industry as a whole. One chief reason is that in general glass is still a more economical container material than plastics, even after taking into consideration reduced freight charges on the latter. Except where sales appeal or technical consideration such as safety or chemical resistance overshadow economical advantages, glass will normally be selected in preference to plastic as a container material.

New styling of bottles and other glass containers by manufacturers is of outstanding interest. This trend is quite pronounced for products in the consumer line where sales advantages may be gained through enhanced container appearance, improved handling in use

or for certain container re-use purposes.

Advances in closure design follow a similar pattern from a customer appeal standpoint, the use of plastic caps and of slip-on plastic closure seals having been given some prominence.

BOTTLE CAP TESTING

Owens-Illinois Glass Co. has recently announced new equipment for testing bottle cap tightness. One use for this is in the routine checking of caps as containers leave the production filling line. This instrument, available in two models, is designed for reading torque from 0 to 25 inch pounds for caps of 15mm. to 38mm. in one model, while the other is capable of readings up to 100 inch pounds when applied to caps over 38mm. size. By checking the removal torque for a measure of cap tightness, one can tell how efficient cap application is. In addition, relationship of other factors may also be studied. These include cap style of finish, bottle finish, type of liner, nature of packaged product and effect of elapsed time from closure application.

Of particular interest to the shipper of hazardous chemicals in carboys is the recent development of apparatus designed for measuring wall thickness of glass carboys. It is reported one device in service can check nine different diameters in a carboy side wall with visual and audible indications being provided if thickness becomes less than a pre-set value in the range between 0.05 and 0.10 inches.

In general wooden container demand appears to have shown improvement beginning with the latter half of 1949. This follows a decline started in 1945. Reduction in requirement for wooden containers for export may be cited as one cause for the decline, while another contributing factor is the steady advance in the use of fiber containers by shippers. Wooden boxes and cases are still preferred in many instances, especially for overseas shipments, and more particularly where the packaged commodity is heavy or it demands extra protection against damage from shock, pilferage or compression.

LAMINATED WOOD CONTAINERS

One noticeable progressive step in this field has been the increasing efforts toward reduction of wood package weight and improvement in reliable package strength through the use of laminated wood. This form of wood is being employed to advantage in boxes, crates and drums. In fact, the I.C.C. Regulations recently were amended to permit the use of plywood for the outside case of carboys employed for export shipments only of certain commodities. This package is covered by a new specification, ICC—1EX.

Although considerable controversy exists over the causes for and the frequency of damage to packages in export movements, wooden containers are employed satisfactorily by many export shippers. Of the several factors which enter into considerations guiding selection of suitable packages for this service, weight density and size of the packaged article or commodity are important. Wood cases or crates are usually selected for heavy merchandise or where large outside packages are involved. Even though some concern has been expressed over the rougher treatment apparently experienced by wooden cases, it is quite likely that improved interior cushioning of such cases would assist in reducing damage to case contents.

METAL DRUMS

by PHILIP P. KENNEDY
Consultant, Engineering Department
E. I. Du Pont de Nemours and Co.

JUST AS demand and supply were becoming adjusted and a good volume of metal drums was forecast for next year, the present international situation has probably upset the apple cart. Indicative of this is current resistance to the proposal to rescind re-use of single-trip containers for explosives and other dangerous articles which has been permitted since 1941. While the recision date was originally set for March 31, 1950 and later extended to August 31, 1950, the Steel Shipping Container Institute has recommended further extension to the Interstate Commerce Commission and the Bureau of Explosives. It is expected that industry will have definite assurance that its requirements for new drums can be readily met before there is any revocation.

Although the metal supply situation is commanding most attention now, developments have not been overlooked nor need they be arrested.

The past year marked acceptance of the 15-gallon stainless steel chemical container as an alternate for the glass carboy and other uneconomical containers. Two new suppliers for this container in both bilge and straight side design have entered the field. While original development work on the container was conducted with Type 304 stainless steel as the construction material, tests are now being made with Types 304 e.l.c., 316, 321, and 347.

CLOSURES

The considerable attention that metal drum closures, especially those for tight head drums, have received has resulted in innovations, and more can be expected in 1951. For example, one closure manufacturer is now supplying pressed-in fittings and die cast plugs for single-trip containers under an arrangement whereby the user who specifies this closure will receive cap seals at no charge. While this may be only a saving of $15-20 per 1000 closures, it can mean a worthwhile amount when consumption is large. Most drum companies can now supply containers equipped with these flanges and plugs.

A new drum closure showing promise in eliminating some sources of trouble experienced with pressed-in fittings as well as inherently costing less, is now in the test stage. In this, the flange is made from the drum body or head sheet, depending upon location of openings, and thus is an integral part of the drum. This eliminates using a gasket in the flange section and also the possibility of improper seating of a separate flange piece in the drum during the press operation. The threads in the flanges and plugs consist of a series of lugs with a slight pitch. Closure is effected by placing the plug on the flange and turning the plug about 30 degrees. The only gasket required is the annular groove on the plug which seats on the periphery of the flange outlet. Gaskets may be fabricated as separate pieces from any gasketing material or may be of the "flowed-in" type.

Another promising closure development under evaluation is a polyethylene plug for single-trip containers. This is being evaluated and appears promising for use with containers requiring an interior lining for product quality protection. Heretofore, it has been necessary to use—at a cost penalty—stainless steel or special alloy plugs where such materials are satisfactory, or ignore the contamination resulting from the small area of plug. A polyethylene plug should be an economical step for improving product quality for a number of chemicals.

The research program on coatings for steel containers fostered by the Steel Shipping Container Institute has made considerable progress in evaluating currently available coatings and in developing new coatings. Industry should benefit from this program during the coming year.

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BOOTH NUMBERS 103, 104, 105

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Chicago Coliseum

September 5, 6, 7, 8, 9, 1950

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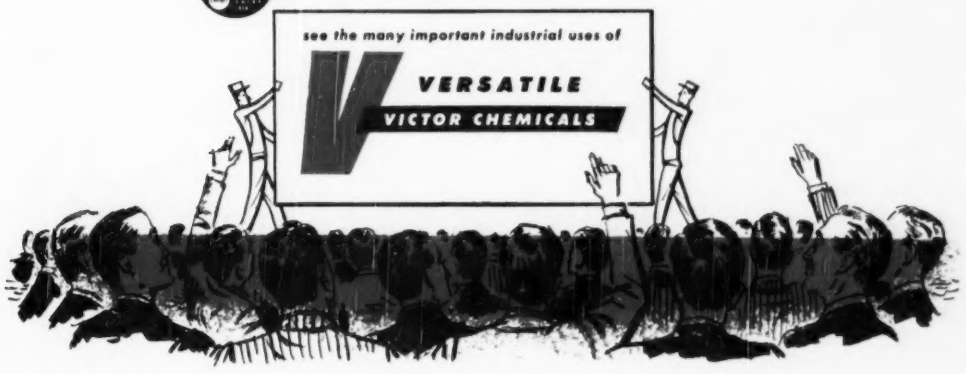

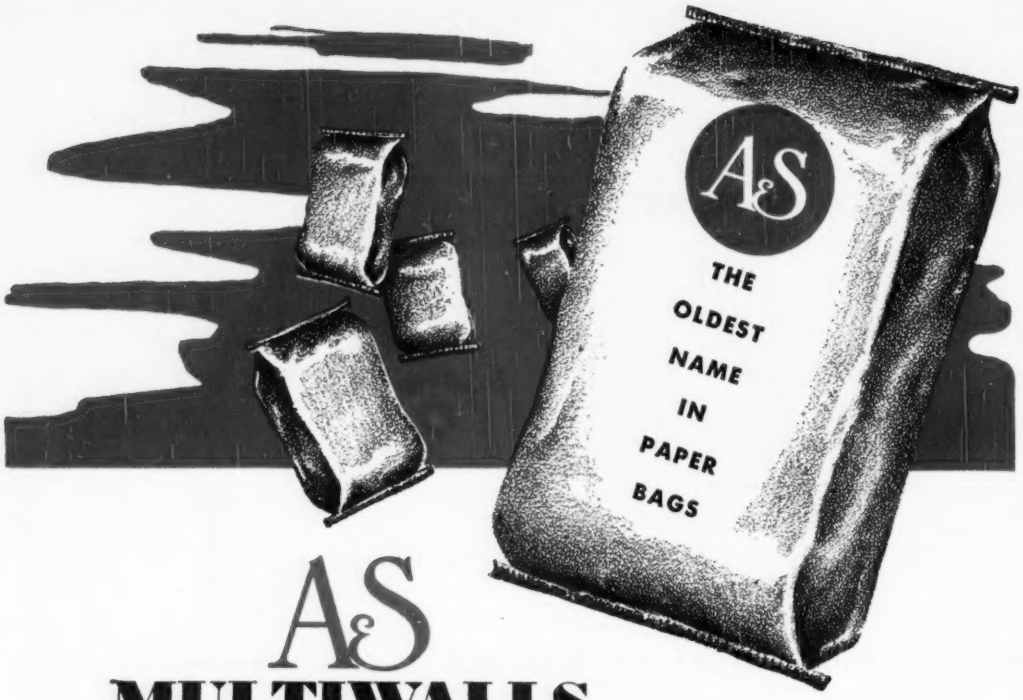

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THE CHEMICAL PANORAMA

NEWS OF THE CHEMICAL PROCESS INDUSTRIES IN PICTURES

PEOPLE

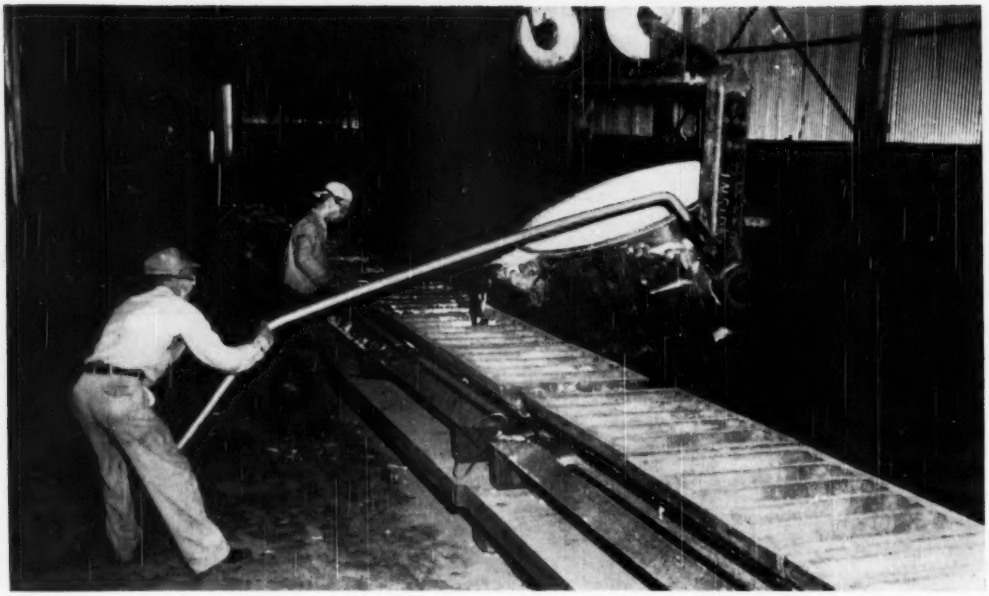
E. D. POWERS elected a vice-president of American Cyanamid Co. He will be in charge of matters concerning plant operations, including related activities of staff departments.

CLAYTON F. RUEBENSAAL, appointed technical director of plastics and resins for the Naugatuck Chemical Div., U. S. Rubber Co.

N. J. GOTHARD, recently appointed chief chemist for Sinclair Refining Co. He will make his headquarters at Harvey, Ill. He has been assistant chief chemist of the company.

HAROLD J. HENRY (l), named vice-president in charge of sales, Commercial Solvents Corp. He has been president and general manager of Tek Hughes.

ELMER F. HINNER (r.), named general manager of Hercules Powder Co.'s Virginia Cellulose Department. He joined Hercules in 1927.



MOLTEN ALUMINUM is poured into pig form. Aluminum is made in reduction units in which electrolytic cells are arranged in series. Current flowing through a molten solution of cryolite and alumina decomposes the alumina into oxygen and aluminum, which is drawn off.

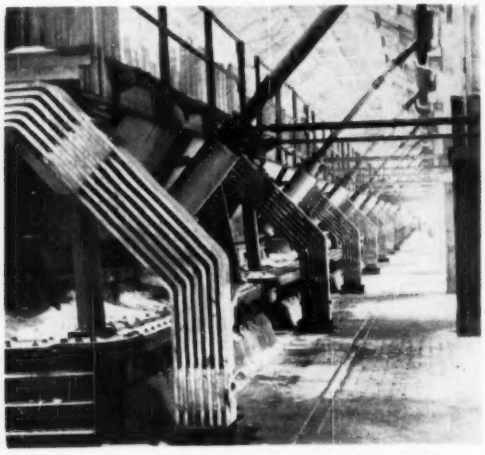
ALUMINUM IN TEXAS

Cheap natural gas at Point Comfort, Texas, determines site choice for Alcoa's new plant.

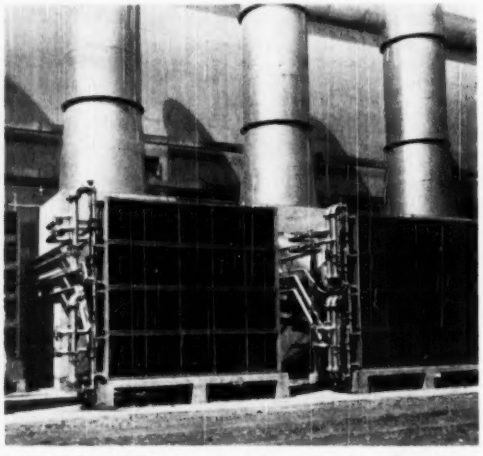
The ALUMINUM CO. of America has started operation of its new aluminum reduction works at Point Comfort, Texas. The works, located on a tract of 3,000 acres on Matagorda Bay near Port Lavaca, consists of 25 buildings with approximately 18½ acres of floor space. Included among these buildings are the pot rooms where aluminum is made; engine rooms for production of electric power; a carbon plant; and various plant service facilities.

The covering of the production building represents the largest single application of industrial corrugated aluminum roofing and siding to date. The greater portion of the roofing and siding was fastened to the buildings by the stud welding process.

Power is derived from the natural gas fields of Texas. Since low-cost electric power is an important consideration in making aluminum economically, the industry is constantly looking for new power sources. It was for this reason that the Point Comfort area, with its natural gas, was chosen for the new reduction works. The Lavaca Pipe Co., a subsidiary of Alcoa, operates the pipe line necessary for gathering and distributing the gas to be used in the work.



ELECTROLYTIC CELLS. The large, carbon-lined steel shells are commonly called reduction pots; a series of pot rooms, a pot line.



HEAT EXCHANGERS for cooling engine water and lubricating oil. The 15'-high exchangers are all aluminum except for the headers.

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Flake...Powder...Spray-dried Beads...Liquid...Paste...Slurry...

What is your detergent problem? Is it one of pricing...meeting and outmatching competition? Are you searching for the particular detergent that best serves *your* purpose? Do you require special formulations?

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SULFRAMIN* AB-40 POWDER
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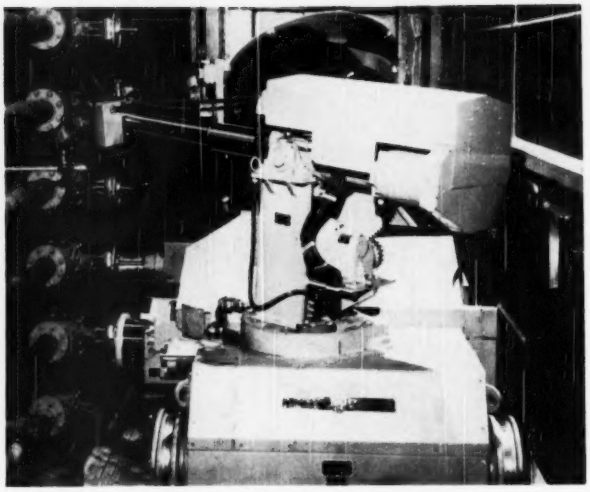
ULTRA Chemical WORKS

ATOM-PROOF HAND

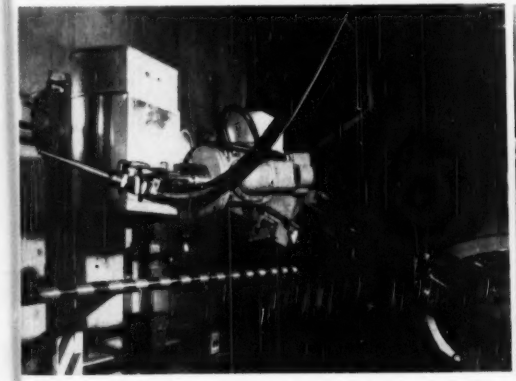
Remote-control robot carries out mechanical tasks in dangerously radioactive areas.

A FIVE-TON, one-armed robot on wheels performs virtually any task expected of the human hand at the U. S. Atomic Energy Commission's Hanford Works. The robot, known as a "tool dolly," was developed by the General Electric Co., which operates the Hanford works for the AEC.

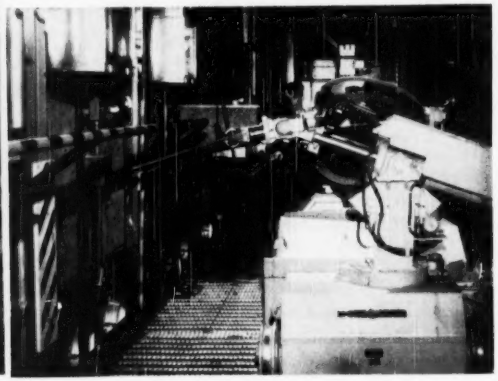
Apparatus is for use in radioactive areas unsafe for human beings. Telescoping arm can be extended, shortened, raised or lowered by remote control. The "hand" is capable of a wrist-bending motion, rotation and gripping. Dolly can take apart and reassemble complex machinery, open and close doors and pick objects as small as a dime from the floor.



VALVE TURNING is one of the robot's jobs. Valve-turning attachments are equipped with electric "feelers" which indicate whether handle is centered in turner.

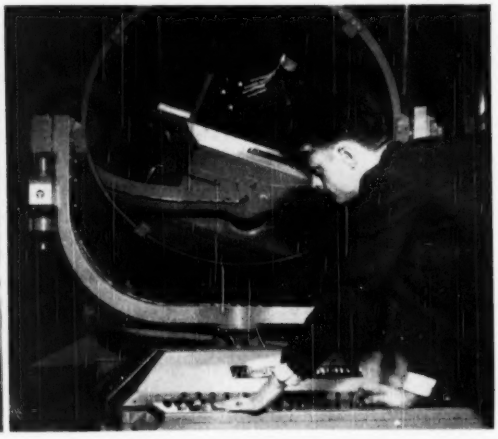


ROBOT can man a hose effectively in case of fire in a radioactive area while an operator guides its actions by remote control.



WRENCH is manipulated with dexterity. The one-armed device has six small electric motors in the arm and hand, and 24 altogether.

OPERATOR uses remote control to put robot through its paces. Control panel lights show tool position when work cannot be seen.



INSTRUMENT PANEL on top of robot for contact operation. The mirror can be used for remote control work out of operator's sight.

Ask yourself these questions

✓ what makes red oil RED ?

The answer is color bodies and other impurities which are not removed from the fatty acids by the usual processes such as distillation and filtration. These impurities not only make the Red Oil red, but they give it the strong odor usually associated with this product. In addition, these impurities make the Red Oil unstable in color when heated in processes such as esterification and saponification.

All grades of W. C. Hardesty Co., Inc., distilled Red Oil have these impurities removed in their *regular plant processing*. Our regular Red Oils are not red but amber in color with a very bland odor and maximum stability to withstand high temperatures without discoloration or oxidation. Our best salesman is a sample. Send for yours today, and compare the color with any other commercial Red Oil.

1005 Low Titre Redolene . . Distilled Oleic
3-5°C Titre
1010 Redolene . . . . . Distilled Oleic
8-10°C Titre

For especially light colored products, we recommend the use of our White Oleic Acid, which is in a color class by itself.

1020 Crystolene (White Oleic Acid)
6-8°C Titre

✓ is distillation of stearic acid enough ?

Since the beginning of the fatty acid industry, producers have relied upon distillation as the means of purifying fatty acids for the production of Stearic Acid.

Distillation is not enough to remove the impurities from the fatty acids. The average commercial Stearic Acid shows this by its relatively dark color, and poor odor and color stability when it is used in making esters and high grade cosmetic soaps and creams.

The W. C. Hardesty Co., Inc., chemists have developed methods of purification of the fatty acids for Stearic Acid production which go far beyond distillation and the purity is guarded through each step in the process of manufacture. This accounts for the excellent color and odor of our Stearic Acids and for the stability of the color and odor when the Stearic Acids are processed in customers' plants.

To produce highest quality esters, soaps and cosmetic preparations, use our Stearic Acids . . . generous testing samples will show you why.

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1220 Double Pressed Stearic Acid
1230 Triple Pressed Stearic Acid
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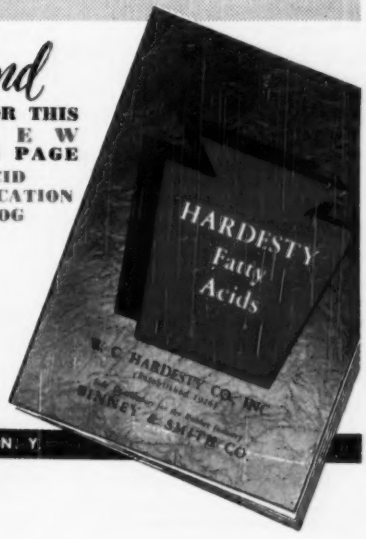

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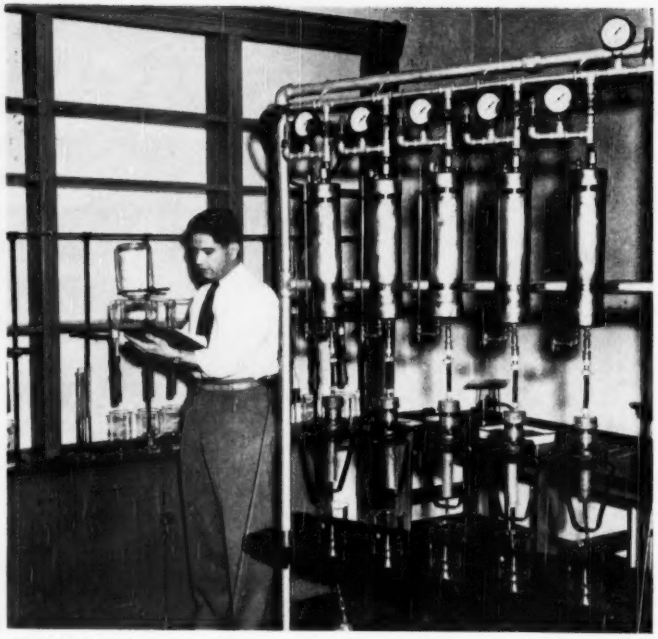


APPARATUS used to measure the movement of solutions through wood in a given interval.

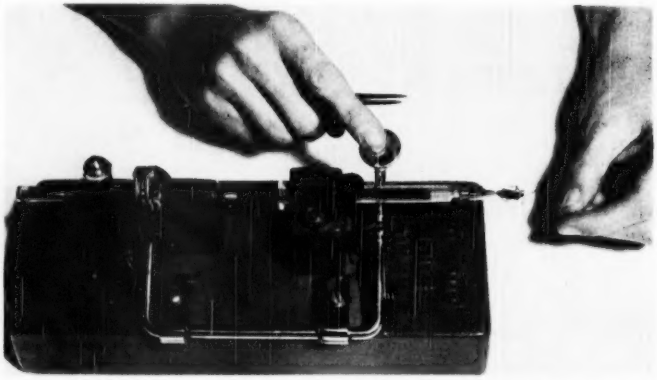
DIAMOND JUBILEE

Oldest governmental station for agricultural research, in Connecticut, celebrates 75th year.

THIS YEAR the Connecticut Agricultural Experiment Station, New Haven, celebrates its 75th anniversary. This was the first permanent institution of its kind to be established by legislative action in America. Samuel W. Johnson, professor of agricultural chemistry at Yale, was directly responsible for its founding. He successfully urged that an institute be organized "to make a *regular business* of discovery for the use of farming."

Since then, many contributions have been made by the Station. It has helped develop a hybrid corn which produces greatly increased yields on smaller acreages, introduced growing of tobacco under shade cloth in the Connecticut Valley, aided in formulations of new organic insecticides, made studies on the nature and control of plant diseases, has helped devise new analytical methods, etc.

Today the Station has a staff of 125 and publishes some 20 bulletins and circulars annually.



TEST SPRAY is injected by micro-injector into milkweed bug to determine its resistance.

How Hooker Phosgenation Service Can Cut Your Production Costs

If you use 10,000 lbs. or more of a phosgene derivative per month, Hooker can show you most interesting savings. In this volume the savings from the elimination of packaging and transporting of the small, special phosgene containers begin to mount up rapidly.

By arranging with Hooker for your phosgenation reactions you save further by eliminating the necessity of special apparatus and personnel especially trained for this work. Hooker facilities are more than adequate for your production requirements and our long experience with custom work such as hydrogenation enable us to meet your production schedules with unfailing regularity.

Listed at the right are six typical phosgenation reactions. These are selected from a much larger number of reactions to indicate the range of work with which we are familiar.

Typical Phosgenations:

1. **Alcohols to Alkyl Chlorocarbonates**

$$ROH + COCl_2 \longrightarrow ROCCl + HCl$$

2. **Alcohols to Dialkyl Carbonates**

$$2ROH + COCl_2 \longrightarrow ROCOR + 2HCl$$

3. **Amines to substituted Carbonyl Chlorides**

$$RNH_2 + COCl_2 \longrightarrow RNHCCl + HCl$$

4. **Amides to Carbonyl Diamides**

$$2RCONH_2 + COCl_2 \longrightarrow RCON\text{-}C\text{-}NOCR + 2HCl$$

5. **Aromatic Hydrocarbons to Ketones**

$$R + COCl_2 \longrightarrow RCR + HCl$$

6. **Phenols to Chlorocarbonates or Carbonates**

$$ROH + COCl_2 \longrightarrow ROCCl + ROH \longrightarrow ROCOR$$

Hooker Bulletin #10, "Phosgenation" describes Hooker services in detail and lists a substantial number of typical reactions. If you are now using phosgene or are interested in compounds made through its use, we suggest that you will find this booklet helpful. Write for your copy.

From the Salt of the Earth

HOOKER ELECTROCHEMICAL COMPANY

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YES, the heat's on in more ways than one. Too bad this vacationer's preparations didn't include flushing his cooling system with a good radiator cleaner.

To formulate such cleaners, Pfizer supplies the major ingredient—Oxalic Acid—to a number of manufacturers. They agree our Oxalic Acid dissolves quickly, flows readily because of its uniform size crystals, and is less hygroscopic than smaller mesh sizes. Of course, these characteristics—plus high purity, uniformity and stability—make Pfizer Oxalic Acid equally desirable for use as a textile, leather and wood bleach, mordant, laundry sour, catalyst and chemical intermediate. Interested users are invited to write today for prices and samples.

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CHEMICAL SPECIALTIES

Specialty Products Share Industrial Boom

6th Annual Survey of NEW CHEMICALS and NEW EQUIPMENT

• High over-all industrial activity has generally meant good business for specialty manufacturers. Those producing primarily for processing industries have been pleased with the pickup from last year's recession. Manufacturers of consumer products have found customers with plenty of money.

Competition is still keen, and new products have been developed to maintain and widen markets. Outstanding examples of the year's progress: allethrin, dieldrin, aldrin and organic thiophosphates among insecticides; silicones in the polish field; hexachlorophene soaps among disinfectants.

• Well over 200 new products in the list beginning on page 257 testify to this industry's resourcefulness in combining chemical raw materials into specialties.

• In the following reviews, experts give the background of these developments, interpret their significance to the industry.

AGRICULTURAL CHEMICALS

by MELVIN GOLDBERG
Pesticide Advisory Service

THE agricultural chemical industry during the 1949-50 season is again characterized by a large volume of materials moving into this field for pesticidal purposes. Just as in the previous season, severe infestations of insects attacking both cotton and corn, combined with a serious threat of grasshoppers, boosted the amount of finished insecticides used to a new record high. Production of the basic materials themselves was greater than in the previous season and would have been even larger had there not been a serious shortage of benzene, chlorine and some of the other raw materials.

In contradiction to last season, prices for the chemicals were at a much higher figure as competition for many of the major raw materials stiffened prices considerably. Carryover from the previous season was very low and when many distributors and consumers realized that the potential danger of severe infestation existed, there was a greater than usual volume of material purchased before time of actual use. However, the industry as a whole suffered once again from consumers' refraining from ordering an adequate amount of finished formulations to take care of initial control programs. In the fall of 1949, production of many of the technical chemicals used in this field was at a low point and once it became apparent that the threat of infestation was real, there was not sufficient time to make up lost production. As of this writing, many production figures are not available, but it is safe to assume that production will be much higher than it was the past 3 to 4 seasons.

INSECTICIDES

There were many new products introduced during the year, the most important of which were aldrin, dieldrin and some of the new organic thiophosphates which are called systemic poisons. These latter materials, among which some classify parathion, have been used to a considerable extent for the first time during the last two seasons. They represent a new approach to the mechanism of insect control since these materials are actually absorbed by the plants; and the aphids and similar pests suck the juices from the plant and are thereby destroyed. Until more work is done on these materials, it is not likely that they will be used to any greater extent than they are now, with the exception of parathion which is firmly established. Parathion, while a hazardous material, can be safely manufactured, processed and used in the field due to very stringent precautionary measures which have been laid down by industry and government.

Lindane, a material containing 99% of the pure gamma isomer of benzene hexachloride was commercially available for the first time. Its current high cost precludes its wide-scale use for many agricultural purposes but due to its relative non-toxicity, it is find-

ing use in fly control in and around dairy barns.

Synthetic pyrethrin-like esters have made notable progress and are now available commercially through at least three different companies. The compound has been given the common name designation "allethrin." Preliminary results indicate that the material can be substituted in some areas of use for the natural pyrethrins but in general, allethrin will be used only as a supplement to or in conjunction with the naturally occurring substance. Considerable experimentation is underway on synergists which can increase allethrin's effectiveness.

In addition to the current Food and Drug Administration hearings on residue tolerances, another specter of government investigation faces industry: The Sabbath resolution of the House of Representatives authorizes a full-dress investigation of the entire synthetic chemical industry as it affects food. The investigation will cover the fields of pesticides and fertilizers as well as synthetic chemicals used in foodstuffs themselves.

There are continuing indications of increasing insect resistance to the newer organic materials. In addition to the strains of DDT-resistant flies, there have been observed strains which are resistant to many of the others including chlordane, BHC and even lindane.

HERBICIDES

The herbicide field was marked by the introduction of trichloroacetic acid (TCA) and potassium cyanate which join 2,4-D and 2,4,5-T in the arsenal of materials available for fighting weeds. The price of 2,4-D fell to an all-time low and, because of high inventories on hand as well as the low profit margins, production dropped considerably.

FUNGICIDES

The metallic copper price steadily rose from the low price of last winter and correspondingly there was a great increase in the price of copper chemicals used in agriculture as fungicides. With copper fungicides priced higher, movement of the organic carbamates in this field again increased. As of this writing, it is not possible to summarize the actual patterns for these materials during the season since the blights extend well into the early fall months.

Synthetic chemical fungicides were further expanded by the commercial availability of new materials. SR-406, a product of the oil industry, is now destined for large scale production after several years of extensive field testing. Chemically, the material is *n*-trichloro methyl thio tetrahydro phthalimide. Another new series of compounds are the copper-zinc combinations for fungicidal use. The latter give greater control of fungi and thereby increase product yield, and also may have some distinct nutritional effect. One such preparation contains 42% of copper and 11% of zinc.

The dithio carbamate series of compounds have been extended by the appearance of other metallic derivatives. The manganese, magnesium, cadmium and calcium salts are now available for experimentation. The nutritional factor is stressed in the use of these compounds as well as their destructive action against fungi.

The chromate complexes have seen newer combinations introduced and there have been some rather unique combinations available for experimental trial. The same chemical organizations sponsoring these types have also introduced a new line of wholly organic derivatives, namely, the mixed glyoxalidines which show fungicidal properties.

PROTECTIVE COATINGS

by HARRY BURRELL,
Finishes Division, Interchemical Corp.

ONE year ago the economic prognostication for the paint industry was not encouraging but during the fall, business improved so that at the end of 1949, the industry had had its third consecutive billion dollar year. During the spring of this year, at least a half dozen paint companies announced the construction of new or expanded production facilities.

At the same time, an unfortunate accident at the Dow Chemical Co. plant destroyed the facilities for producing butadiene-styrene latex. With supply from a major producer cut off, it quickly became evident that synthetic latex had during the year assumed an important position in the manufacture of water-based paints. These products represent the current state of development of a line which is as old as whitewash and which has proceeded through the stages of calsomine, casein paints, and emulsified oleoresinous vehicles. Current materials are based on latices similar to those produced by our synthetic rubber industry but higher in styrene content. They have been widely accepted because of improved washability, tougher and more flexible films, fast dry and low odor, not to mention, of course, the obvious advantages of economy and safety resulting from using water as a thinner. With increased labor costs many a housewife is taking advantage of their easy application to do her own redecorating.

HOUSEHOLD PRODUCTS

Household products seem to keynote the present trend and many new products have been designed to entice the retail market. Among these is a strippable coating to replace window shades which may be sprayed directly on the glass to reduce glare and light intensity or to obscure visibility temporarily, and which may subsequently be peeled off like the skin from a banana. Another ingenious offering is the packaging of lacquer, aluminum paint and screen enamel in aerosol bombs which use Freon to provide the pressure for a self-contained spray gun. For amateur Sloppy Joes, there is a canstretcher which puts extra mixing capacity on top of the paint can, and a paint brush with a hollow handle from which paint is fed by a spring-actuated plunger and a putty packed like sausage in a cellophane casing. For Lazy Luke, they have developed a protective coating for rusty iron which can be applied right on top of the rust and which is claimed to penetrate the pores and prevent further corrosion. There have also appeared several competitive materials of the marshmallow-type, fire-resistant coating announced two or three years ago, which swells up to form foam insulation when heated.

Paint containing DDT and calculated to be lethal to insects is available from several sources while other materials are intended to reduce mildew growth in hot, humid climates. An interesting innovation is the recommendation to use calcium oxide as a white pigment in outdoor oil paint. Although commonly used for whitewash, it has always been regarded as useless in oil paints, but it is now claimed that small amounts improve durability and help retain whiteness. Another product is a coating to replace the paper moisture-barrier in new house construction. The busy housewife seems to be looking with increased favor on linoleum varnishes and lacquers as replacements for self-polishing waxes because they need be applied less frequently and hold their appearance better.

INDUSTRIAL SCENE

In the industrial field, the announced construction of a new plant to manu-

facture Epon resins augers well for their increased acceptance in coatings which must have top resistance to water, alkali and abrasion. Maleic anhydride manufacturers seem to be competing with breakfast food producers in the new shapes in which they market the same product, since maleic can now be obtained in the form of briquets, broken rods or hollow cylinders as well as solid cakes. Another interesting example of marketing is the offering of liquid phthalic anhydride in tank cars to large users. The reduction of four cents per pound in the cost of phthalic to 17.5 cents is also noteworthy.

The unequalled resistance to chemical attack of Teflon and Kel-F plastics has been attractive to coating manufacturers but because of their insolubility, it has been impossible to use them. Now they have been made available as dispersions which can be used to line tanks, valves and other equipment used for purposes which can support the cost. These materials probably have the distinction of being the most costly coatings ever sold since they cost in the neighborhood of $100 per gallon.

Oils and alkyds reacted with styrene and cyclopentadine continue to enjoy popularity, and the styrenation of allyl starch may increase the utility of that material by improving its water resistance. In the pigment line, daylight fluorescent colors are much in demand for advertising purposes, and dispersion of a new transparent gold pigment have been made available under the name of Midas Gold.

RUBBER CHEMICALS

by ALLYN I. BRANDT
General Sales Manager,
B. F. Goodrich Chemical Co.

THE rubber-processing chemicals business, an old and established one dating back more than 25 years, was not characterized by any new or startling developments in 1949, or in recent years.

Competent research laboratories have examined literally hundreds of organic chemicals, and the effective ones have been established in the rubber industry for many years.

Rubber chemicals consumption is tied in directly with the volume of rubber hydrocarbon of all types consumed. A good demand for rubber chemicals has existed for the past 3 years when rubber and reclaimed rubber consumption has been at unusually high levels as compared with pre-war years.

The mass of technical data and information offered by rubber chemical manufacturers has tended to standardize compounding practices, and it is not surprising to find few changes in production and consumption figures when studying the statistics of rubber-processing chemicals in the U. S. Tariff Commission Reports from year to year.

The thiazole derivatives, for example, which constituted 75% of the production of rubber accelerators in 1949, have varied only slightly in production in recent years (73.0% of rubber accelerator production in 1946, and 74.5% in 1948). These chemicals find a large market in tire casings in transportation items, which account for 65% of all new rubber consumed.

ACCELERATORS

Total production of accelerators in 1949 was 35,956,000 pounds, 14% less than the 41,973,000 pounds reported in 1948. Total production of anti-oxidants last year was 32,966,000 pounds, 16% less than the 1948 production of 39,390,300 pounds. A decline in volume of rubber hydrocarbon consumed coupled with lower export requirements is responsible for this decrease in production of accelerators and anti-oxidants last year.

During 1949, several new anti-oxidants in the non-staining field were introduced. For the first time, anti-oxidants of this type for rubber are available in the low price field. Characterized by their lack of nitrogen-bearing groups, the new anti-oxidants are not generally as good as established age resistors for compounding black rubber goods, but are expected to find a limited market in white and light colored goods where resistance to sunlight discoloration is an important requisite.

Price trends in rubber chemicals are upward at the present time, due to increases in the costs of chemical intermediates, labor, maintenance, depreciation, and freight charges. Major accelerators and anti-oxidants are among a few of the chemicals on the market today which are still selling below or at pre-war levels.

Looking ahead, it is our belief that there will be very little change in types of chemicals used in rubber-processing, although from time to time a specialty chemical designed for a particular need may be introduced.

POLISHES

by DANIEL SCHOENHOLZ
Research Group Director,
Wax, Paint & Varnish Section
Foster D. Snell, Inc.

CARNAUBA wax has for several months been quoted in the U.S. at prices below what would be permissible by the Brazilian Government's floor under Carnauba prices. Rumor has it that this situation is due to the use of this commodity in barter deals with American manufacturers of electrical and automotive goods who have accepted the wax in lieu of dollars.

An interesting new wax being offered by some importers in the German manufactured I.G. KPS wax. This product is easily emulsifiable and yields an almost transparent dispersion much finer in particle size than is ordinarily obtainable with carnauba wax. Probable uses are in self-polishing waxes and in wax containing scrub soaps.

High quality montan wax is now available from California mines and is competing with imported grades. It is hoped that this development will eventually lead to the domestic manufacture of a line of derived waxes similar to the imported I.G. waxes.

Sugar cane wax extracted from the press cake residue arising in sugar cane refining is now an article of commerce. Crude wax is present in the press cake to the extent of 21% dry basis. Approximately 60,000,000 lbs. of wax is theoretically available yearly from Cuban mills alone. Various grades and fractions are obtainable depending on the solvent refining procedure used. It is expected that sugar cane wax will receive intense examination for possible use in the wax emulsion, solvent polish and other wax utilizing fields.

Advanced refining procedures based upon liquid propane extractions are being applied to petroleum-derived waxes. Now on the market are high-melting paraffin waxes and de-oiled microcrystalline waxes which exhibit reduced susceptibility to softening with elevation of temperature. This property should prove beneficial in wax polishes by reducing tendencies towards increased softness and tackiness in hot weather.

A new development in automobile polishes is the use of silicone oils.

There is currently a great deal of advertising of such silicone-containing polishes. This type of polish presents two outstanding advantages over the usual oil polish. First, the dried polish film can be buffed with greater ease giving a greater degree of freedom from oiliness or greasiness. Second, the polish film exhibits a deeper luster than is accomplished with mineral oil alone. It is believed that the inertness and low volatility of the silicone oils should contribute to the durability and protective properties of the film.

Silicone oils, in addition to being used in cleaner types of oil polishes, are also being used in wax type auto polishes in which they markedly reduce the work of buffing without introducing the greasiness which generally results from compounding mineral oils with waxes. They have also appeared in furniture polish, and, it is expected that they will shortly appear in other types of polishes, such as shoe and metal polishes. Furniture and shoe polishes of the wax types should benefit by the contribution of easier buffing and better and more permanent luster. It is believed that better protection against tarnishing should result in metal polishes.

The effect of the silicone oils in facilitating buffing without introducing greasiness appears to be due to the incompatible nature of the silicone oil with waxes. The silicone oil thus acts as a lubricant in the buffing process and since it is substantially insoluble in waxes does not produce a softening effect.

The fluorinated high molecular weight hydrocarbons show similar characteristics in some respects to the silicone oils with regard to compatibility and are even more inert chemically. Members of this class of compounds were originally produced in significant quantities in connection with the Atomic Bomb program. They are now available at prohibitive prices of approximately $60 per pound. The development of industrial uses and cheaper and larger scale production methods should lead to reduced prices.

FLOOR POLISHES

Self-polishing waxes continue to command the floor polish field. Use of colloidal silica dispersions is being featured by a number of manufacturers serving the industrial maintenance trade. It is claimed that this additive reduces slipperiness without sacrifice of performance.

The General Services Administration has issued Water Emulsion Floor Wax specification 784a which is a departure in principle from the older Federal Specification PW-151a. The new specification depends largely on performance requirements rather than on compositional requirements to characterize floor waxes considered acceptable for use by government agencies. While some doubt exists as to the significance of some of the tests, it is generally agreed that this new specification should lead to a definite upgrading of products being offered for government purchase.

TEXTILE CHEMICALS

by ROBERT E. WRIGHT and MILTON HARRIS
Harris Research Laboratories, Wash., D.C.

Milton Harris

THE general economic picture in the textile industry looked much brighter in mid-1950 than it did one year earlier, when the industry found itself in the depth of a recession. Cottons and rayons have made a somewhat better recovery than have woolens and worsteds, with heavy industrial cotton goods at near-boom levels and first-quarter U. S. rayon production (305.7 million pounds) surpassing the highest previous quarter by 5%.

In the expanding range of new fibres, Vicara, produced from corn protein and those of the acrylic group are attracting a high level of interest. The latter includes Orlon, a polyacrylonitrile fiber now in limited production as continuous filament but soon to be produced in staple form in a new plant now under construction; Dynel, an acrylonitrile-vinyl chloride copolymer manufactured in staple lengths; and another copolymer fiber under development and reported to contain about 85% acrylonitrile. Expansion of facilities by the sole producer of acrylonitrile, or entry of competitors in the field have been forecast. Another sign of activity in this direction is the announcement of commercial production of dimethyl formamide, a solvent for Orlon and presumably useful for preparing Orlon spin baths.

A substantial increase in production of adiponitrile, a nylon intermediate, will result from the construction this year of a new plant for the manufacture of furfural; consumption of corncobs and oat hulls will be about 400 million pounds a year. Considerable interest in the U. S. version of the British Terylene, an ethylene glycol-terephthalate filament, has been shown and further stimulation is obtained from the announcement of tonnage production of *p*-xylene, from which terephthalic acid is produced

PROCESSING DEVELOPMENTS

A number of the developments of the past year in textile processing and finishing are likely to have some influence in the types and volume of chemicals used in various branches of the industry. Typical of these are a rapid continuous bleaching process for cotton, utilizing caustic soda and sodium hypochlorite, and a low-temperature wool piece goods scouring system using relatively large amounts of a synthetic detergent and employing sodium bicarbonate or sodium chloride as a builder. Another development of interest in wool scouring, although still in the experimental stage, is a method for using the suint present in the wool, in combination with small amounts of an alcohol, as the scouring agent. Still another new entry in the processing field is a method of stripping color from wool, and at the same time increasing resistance to chemical damage, by rupturing disulfide linkages with a reducing agent and simultaneously rebuilding more stable linkages by the use of ethylene dibromide.

Among special-purpose finishes, those employing urea- and melamine-formaldehyde resins for such effects as crease-resistance and dimensional stability on cottons and rayons continue to gain in volume and variety of applications. Among the year's advances in this area were the introduction of a new urea-formaldehyde resin with reduced chlorine-retaining characteristics, and the finding that "acid colloids" (aqueous sols of certain acid-treated U-F and M-F precondensates) showed promise in a number of special textile applications. Possible textile uses, such as for permanent, launderable sizing, are also foreseen for an experimental water-soluble resin obtained by copolymerization of allylidene diacetate and vinyl acetate followed by hydrolytic removal of acetate groups.

SPECIAL TREATMENTS

In the effort to protect textile materials from microbiological attack, promising results have been achieved with phenyl mercuric Fixtan, acyl derivatives of pentachlorophenol (particularly for application to ropes and cordage), and beta-naphthol (for use in high-temperature areas.) Another field of deterioration prevention, that of

wool shrinkage control, has seen a remarkable growth in volume of material treated, mostly by chlorination processes and to a lesser extent by melamine resins. An indication of the extent of commercial acceptance of antifelting treatments is shown by the estimate that 95% of current wool sock production is treated for shrink-resistance; increasing use is also being made of shrinkage-control processes in shirts, blankets, sweaters, knitting yarns, and other items.

PULP AND PAPER CHEMICALS

by K. E. YOUNGCHILD
Paper Chemicals Department,
American Cyanamid Co.

AMERICA'S fifth largest industry is continuing its high production rate in 1950—90 to 100% of capacity—to meet the strong demand for pulp and paper. As a consumer of chemicals, the paper industry ranks a strong third (based on available 1948 figures). With increased production being added and planned for 1950, requirements for chemicals will be even greater than they have been.

Demand for better grades of papers with higher specifications made possible by chemical modifiers and additives, and the continuing application of paper in new fields are other factors which are increasing the market for chemicals.

Many chemicals, high priced by former paper mill concepts, are finding a welcome market because they make it possible for paper products to replace many other more expensive materials.

PULPING AND BLEACHING

A growth in chemical demand based on increased production facilities has been experienced in the pulping field. The increase has been largely in the sulphate and semi-chemical pulping processes. These require caustic soda, sodium sulphide, salt cake, sulphur, and soda ash. One large pulp mill has changed its sulphite process from a calcium-base to a magnesium-base cooking liquor. Recovery of the base chemicals is one object of the change. Ammonia-base sulphite liquor also is being investigated.

Increased consumer demand for whiter papers has brought about increasing pressure for more bleaching chemicals from chemical suppliers. Chlorine demand is taking available supplies. Expected new requirements for chlorine will have to be met with new production.

Chlorine dioxide in one stage of the bleach helps in the quest for higher, more stable, white pulps. Peroxides of sodium and hydrogen are used for bleaching, particularly in the ground wood pulps.

HEAVY CHEMICALS

Demand for aluminum sulphate, or paper maker's alum, has grown with new production and also with higher sizing of some grades of paper. Use of this chemical as a coagulant in the treatment of mill water for removal of color and suspended solids to add greater brightness to the sheet has been extensive. Sodium aluminate, which is an alkaline source of alumina, is often used in conjunction with aluminum sulphate. Another product recently introduced, sodium phospho aluminate, is attracting increased interest from the profit-conscious paper maker. This product can be considered to be principally a double salt of sodium aluminate and sodium orthophosphate. Both sodium aluminate and sodium phospho aluminate are being used primarily for pH control and their ability to improve retention of fiber fines and expensive fillers in the sheets. Improved surface characteristics, less corrosion of wires and equipment and reduction of total acidity in the paper, accompany their use.

SIZING

Improvements in resistance of paper to wetting and penetration of water and other fluids have raised the demand for sizing chemicals. Rosin size is the chief chemical used. An increase from 70% solids, the normal solids content, to 80% solids, has given those mills far from the southern producing points an economic aid by reduction of freight on the solids received.

Excellent refined rosins from tall oil, bright in color, with uniformity and exceptional cleanliness are now available. Rosin sizes made from tall oil rosins seem to be good possibilities.

The trend toward pale wood rosin sizes from gum rosin sizes continues.

New technological advances in rosin size result in current offerings of pale wood rosin sizes having reduced color degradation in high white papers, low foaming properties, exceptional cleanliness, and colors up to, and including, X grade of rosin. Specially modified rosin sizes are offered for improved lactic acid resistance.

Wax sizes made from various types of petroleum waxes continue to be useful. Improved water resistance, lactic acid and blood resistance are among the qualities desired. Surface application to provide water repellency, better printing and improved gloss ink resistance, is increasing. Better folding and forming properties of paper result from their use.

Combinations of wax sizes and carboxymethyl cellulose or zein improve grease resistance, scuff resistance and printability of paper. Some new stearate emulsions have appeared.

A new surface water repellent, stearato chromic chloride, has been announced.

Application of silicone resins to paper has recently been placed on a commercial basis. A highly water repellent surface having tack-repellent properties that even releases pressure sensitive tape is obtainable.

SYNTHETIC RESINS

Demand for wet strength resins has increased as new paper specialties are developed. Melamine-formaldehyde and urea-formaldehyde resins continue to dominate the field. Many new urea resins of both anionic and cationic types are being announced by chemical manufacturers. The popular resins are all of the so-called "beater additive" types which can be added directly to the pulp slurry before the paper is formed. They are presumably adsorbed by the fibers due to the difference in charge between the resin colloid and the cellulose fiber or to the presence of a mutual bonding agent such as alum.

A very few wet strength resins for surface applications are noted and efforts appear to be experimental at this time. Addition of small amounts of neoprene latex by the beater addition method is said to give wet strength properties to paper.

Several efforts by paper companies have been made, in cooperation with various chemical companies, to incorporate different types of resins in paper by beater addition processes. Resin contents equalling fiber content have been successfully retained and paper so made has exhibited good laminating properties when subsequently molded. Some of the resins offered to date are polystyrenes, butadiene-styrene latices, butadiene-acrylonitrile latices, ethyl acrylate polymers and ethyl acrylate copolymers, various vinyl resins, styrene-maleic polymers, phenolics and other combinations for

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specific results. This field is very promising as an outlet for synthetic resins in the paper industry.

COATINGS

Casein, soya bean protein, and starch continue to dominate the field of coating pigment adhesives. Starch producers have been active in modifying starches for special effects and for improved handling.

A new method of modifying starch in the presence of $AlCl_3{\cdot}6H_2O$ has been announced.

New methods of handling enzymes for starch converting are appearing. Small capsulated units for convenient measurement of enzyme have been finding ready acceptance.

Water resistance of starch coatings is being improved with urea and melamine resins. A new method of preparing water-resistant starch coatings involves the use of potassium pyro antimonate.

Increased quantities of potato starch are being marketed for surface sizing and for beater addition. Increasing use of butadiene-styrene latex as a pigment binder and for modifying casein or starch is apparent. Improved printing, better folding, less dusting of the coating, and other beneficial results are claimed.

Protective coatings have been highlighted by the quick acceptance of polyethylene coated papers. New extrusion type coaters have been installed and kraft papers, polyethylene coated, have found their way into the paper bag field. Good moisture-vapor resistance, grease and solvent resistance, along with good low temperature flexibility, make the coated paper very interesting for many packaging jobs. Other resins, many of the vinyl types, are finding increased application as both protective and decorative coatings.

SPECIALTIES

New defoamers are being offered. One is said to be based on a silicone resin. Small quantities are reported to be very effective. New methods of marketing defoamers include the sale of a brick which is scored to allow the user to break off desired small amounts for addition to the system.

Newer rewetting agents of interest are cationic types which can be added directly to the stock system. They prevent self-sizing in absorbent papers upon aging.

Paper softening through use of cationic oil dispersions in water has found a ready use in the tissue, toweling and napkin fields. Other softening agents include monoethanolamine sulfamate and related amine sulfamates which are claimed to give softening effects in paper together with flameproofing properties. A good, inexpensive flameproofing agent for paper that would be water insoluble is very much in demand.

A special locust bean product has given excellent improvement in dry bursting strength of paper in reported applications.

Interest continues to be strong in slime control agents. Other fungicidal products include mold growth preventives such as the diphenyl type.

America has the largest per capita consumption of paper of any nation in the world—close to 331 lbs. per person in 1949. The industry has shown a steady growth over the last thirty years and current estimates are that per capita consumption of paper in 1975 will be 500 lbs. The chemical industry has had much to do with increased paper consumption because its products have given paper new and better characteristics leading to new uses. As consumption of paper increases even further, it is only logical that the consumption of chemicals will increase proportionately.

INDUSTRIAL ADHESIVES

by C. G. CALDWELL,
Director of Research
National Starch Products, Inc.

DUE to continuing high costs of labor and equipment more and more emphasis is being placed on the greater volume of production made possible by faster-working and easier-to-use adhesives and machines for applying them.

HOT MELTS

Machines have been developed for the binding and covering of books with hot melt adhesives and for use with thermoplastic-coated labels, wrappings and board. Quite new is a labeling machine that applies a hot melt adhesive directly to stacked labels.

The unique properties of polyethylene film are leading to a multitude of different applications. Fabrication by heat sealing to itself, to paper, glassine, board, cloth and burlap is common but sometimes difficult due to the low temperature deformability of the polyethylene. Recent studies

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indicate that blends of polyethylene with as little as 15% of polyisobutylene result in reduced temperature sensitivity and corresponding improved processing.

There is promise that satisfactory adhesives for polyethylene will be developed. These will probably depend on a suction type bond since materials with strong specific adhesion characteristics for polyethylene are not available.

EMULSIONS

Polyamide resins formed by condensing dimerized vegetable oil acids with dithylene amine are now available as aqueous emulsions for adhesive purposes.

Extensive use is being made of emulsions for direct application to plain tape in the assembly or joining of boxes. This procedure makes possible water-resistant joints which cannot be obtained with the conventional remoistening gummed tape.

Wider application of acrylate resin emulsions for adhesive purposes may be expected as a result of the recent appreciable price reductions.

THERMOSETTING ADHESIVES

A variety of new catalysts for urea and melamine formaldehyde resins for both hot-press and high-frequency curing are being offered. These give longer pot life and assembly times and faster curing cycles.

Significant reductions in the prices of urea adhesives are taking place. Also, large wood working plants can save by using liquid urea resins shipped in tank car or truck. Long distance shipping of ureas is made possible by formulating lower solids resins which have a longer storage life.

Alkaline curing resins of the ketone-aldehyde type are of increasing interest because of their suitability for use with starch to give water-resistant bonds in making bags, corrugated board, etc. Starch adhesive formulations frequently contain borax to give tack and speed of set and such products are not readily used with acid curing resins.

VEGETABLE AND ANIMAL GLUE

Of interest to users of cold water-soluble dry vegetable adhesives is a new machine which automatically prepares, dissolves and controls the viscosity of adhesive solutions. It is also suitable for diluting liquid glues to a uniform viscosity.

Bonding corrugated board by the gelatinization of starch *in situ* on heated rolls has been made more economical by the use of modified starches which gelatinize more rapidly and to a higher-viscosity, and thus can be used in lower concentrations.

Animal glue formulations for wood assembly have been modified to give better working properties at lower temperatures. Tackier and gummier products have appeared for wrapping paper boxes.

NEW MATERIALS

Diisocyanates, while not new, are being exploited to a greater extent in conjunction with various synthetic and modified rubbers, particularly to adhere rubber to metal and to cotton and rayon cords and fabrics.

Polyvinyl ethers, also not new, are becoming more available for exploitation.

A new asphalt modified with phosphorus pentoxide during the conventional air blowing is much improved with regard to sensitivity of viscosity to temperature, and becomes extremely tough and resistant to heat and weathering.

A new use of phenolics as a binder for sand in the making of foundry molds and cores is expected eventually to greatly expand the market for thermosetting resin adhesives. The advantages claimed over the conventional sand molds and cores are accurate dimensions, smooth surface, uniform moldings, reduction of sand requirements and handling by 95%, and increased production of molds.

An application for adhesives of far reaching importance is the adhering of fungicidal dusts and sprays to agricultural crops. Adhesives also may play a part in the direct spray application of nutrients to plants. Water resistance of the adhesive may be an important factor to maintain the concentration of fungicide or nutrient despite rain. On the other hand, removal of toxic residues by washing and the gradual release of nutrients to the growing plant must also be possible.

A large number of patents covering new adhesive compositions appeared during the last year. Several relate to the use of thermosetting resins of the urea, melamine or phenolic types in combination with vinyl polymers such as polyvinyl butyral acetal, polyvinyl alcohol and styrene-maleic anhydride copolymers.

Improved adhesion of polyethylene and polyisobutylene to metal and glass was claimed by incorporation of small amounts of ammonium sulfamate and chlorinated paraffins. Another patent describes a process of swelling or dissolving polyisobutylene in a vinyl monomer containing benzoyl peroxide, with curing of the bond being accom-

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Neo-Fat 7 (Caprylic Acid)

Mean Molecular Weight	145.7
Titer	13.0°C.
Iodine Value (Wijs)	0.8
Neutralization Value	385.0
Color...Water White	Odor...Characteristic

Typical Composition

Caprylic Acid	90.0%
Caproic Acid	3.0%
Capric Acid	7.0%

Neo-Fat 9 (Capric Acid)

Mean Molecular Weight	173.3
Titer	30.0°C.
Iodine Value (Wijs)	1.2
Neutralization Value	323.7
Color...White	Odor...Characteristic

Typical Composition

Capric Acid	90.0%
Lauric Acid	7.0%
Caprylic Acid	3.0%

Neo-Fat 11 (Lauric Acid)

Mean Molecular Weight	203.0
Titer	37.8°C.
Iodine Value (Wijs)	1.0
Neutralization Value	276.0
Color...White	Odor...Trace

Typical Composition

Lauric Acid	90.0%
Myristic Acid	9.0%
Unsaturated Acids	1.0%
Capric Acid	Trace

Neo-Fat 13 (Myristic Acid)

Mean Molecular Weight	226.0
Titer	37.8°C.
Iodine Value (Wijs)	2.0
Neutralization Value	248.0
Color...White	Odor...Characteristic

Typical Composition

Myristic Acid	90.0%
Lauric Acid	4.0%
Palmitic Acid	4.0%
Unsaturated Acids	2.0%

Neo-Fat 1-56 (Palmitic Acid)

Mean Molecular Weight	258.0
Titer	56.0°C.
Iodine Value (Wijs)	3.0
Neutralization Value	216.0
Color...White	Odor...Trace

Typical Composition

Palmitic Acid	90.0%
Oleic Acid	4.0%
Stearic Acid	6.0%

Neo-Fat 1-65 Stearic Acid

Mean Molecular Weight	282.5
Titer	67.0°C.
Iodine Value (Wijs)	3.0
Neutralization Value	198.0
Color...White	Odor...Trace

Typical Composition

Stearic Acid	90.0%
Palmitic Acid	6.0%
Oleic Acid	4.0%

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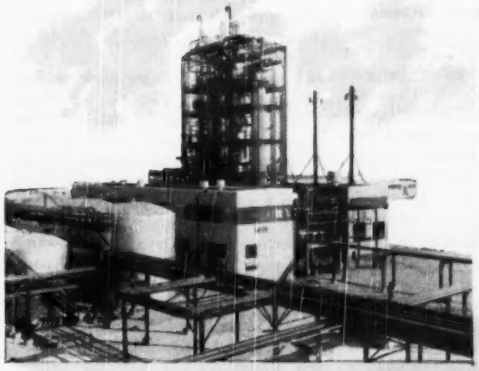

Fatty acids are discussed in a series of technical booklets entitled, "The Chemistry of Fatty Acids," "The Selection and Use of Fatty Acids" and "The Handling, Sampling and Testing of Fatty Acids."

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plished by heat and pressure. Compositions of ethylene-vinyl acetate copolymers with tackifiers to produce pressure-sensitive adhesives and with hard resins and waxes to produce moisture-proof heat-sealing compounds have been claimed.

In summary it may be said that recent adhesives progress has emphasized new techniques, new machines and new uses to gain greater speeds and lowered production costs.

LEATHER CHEMICALS

by HAROLD G. TURLEY
Rohm & Haas Co.

IT seems to the writer that the year under review has produced fewer chemical novelties or specialties for the leather industry than the previous years since the war. This may be directly traceable to the war which stimulated research into many aspects of leather as in all other materials. After the war, visiting teams of the Army and Department of Commerce brought back from Germany information dealing with new products and processes developed by the enemy. Since that time, there has been a period of appraisal and some products have been found wanting in performance by our standards.

With leather substitutes continuing to increase their sale for a wide variety of purposes, emphasis has been placed on leather quality. Realizing the change in leather's position, the leather industry is awakening to the need of specific educational institutes. The School of leather technology at Pratt Institute has been in effect for two years and now the State of Massachusetts has established, at the Lowell Institute, a center for training and research in leather. Leather making and shoe making are traditional Massachusetts industries.

The American Leather Chemists Association has reorganized its technical committees to facilitate and streamline the technical work undertaken by the Association. There is some debate as to who will save the leather industry, the tanner or the chemist. In some quarters, the responsibility is publicly placed on the shoulders of the chemists, but to the writer it seems as if the business men and management must also have greater breadth of vision, better understanding of the economics of hides and skins, and a finer appreciation of the qualities of leather. Leather at its finest is still a good and appealing product in a machine age.

It has been pointed out this year in an article by Flinn and Bell that the chemicals used in the leather industry have an annual volume of 600,000 tons, worth $100,000,000. Of these, the three important groups are, in order, vegetable tanning materials, heavy chemicals, and other tanning agents.

VEGETABLE TANS

The United States is increasingly aware of its dependence on foreign countries for the supply of natural tanning materials. The two main vegetable tans imported are quebracho from Argentina, and wattle from South Africa. Not inconsiderable quantities of mangrove, myrobalans, and divi divi are used. The U.S. Government is concerned with fostering the development of our own native tanning materials. The work of the U.S. Department of Agriculture through the Eastern Regional Research Laboratory on canaigre, an annual root crop, is progressing to the harvesting of 14 acres to provide enough material to put through pilot plant operations. Canaigre is an excellent tanning product and can produce a good leather of high yield. The work on development of native sumacs is also proceeding. Everyone must be familiar with the brilliant fall colors given by our native sumacs and some of the species give tanning material equal to the best imported sumac. Oak slabs, a by-product of another industry in the South, are another valuable source of tanning material. Our native chestnut, although most of the stands of timber have been ruined by the devastating chestnut blight, are also valuable. Attempts are being made to plant blight-resistant oriental chestnuts. There is much tanning material in the western regions and work is being done on the Oregon Douglas fir and sugar pine which give a pine bark extract suitable for tanning matter.

On the other hand, the work with domestic synthetic tans progresses and this year the Quartermaster Department of the Army completed a large scale practical test tanning sole leather entirely with domestic synthetic tans —the product Orotan being used. The test was successful and the leather appeared to be excellent and the shoes are now being tested carefully under actual Army supervision for their durability and wearing quality.

The Army Quartermaster's program

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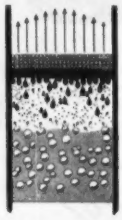

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on synthetic fats is making progress and it is reported that certain synthetic oils are equal in some cases to the fat substitutes used by the Germans during the last war. Some successful products are chlorinated hydrocarbons which give good water resistance when used as stuffing material on heavy leather.

In mineral tannages, the Eastern Regional Research Laboratory has worked out a process of retanning insole leather—this is the thin slice of leather in contact with the wearer's foot or stocking—by alum and the quality has been improved 68%.

FORMATES FOR CHROME TANNING

In chrome tanning, sodium and calcium formates are being offered for the improvement and speeding up of the regular orthodox chrome tannage. The use of polymeric phosphates is also recommended as a pretan for speeding up the vegetable tanning process. It appears that the phosphate first combines with the hide and is subsequently displaced by the vegetable tanning material. For this purpose, the product Calgon is being recommended.

The Zirconium tannage continues to attract attention and a paper by the inventor of this process gives the reasons and presents the data for concluding that this is a true cationic tannage, that is the tannage mechanism takes place through the medium of the Zircotan cation.

Iron tannage with its important potential advantages continues to receive attention and new efforts of modifying iron to improve its tanning quality have been suggested by using hydroxy acetic acid as a "masking" agent. Iron tannings are also being developed with combinations of synthetic tans.

Impregnation of leather to improve some of its properties such as waterproofness, is proceeding and such materials as alum, polymeric acrylates and methacrylates, silicones and amino silicones show much promise.

Leather like many other natural materials is subject to deterioration especially in hot humid climates by mold growth. Work has shown that it is possible to protect successfully such leathers as are found in cases, belts, etc., with many fungicides. *p*-Nitrophenol and salicyl anilide are favorable treatments.

To recover for present use, the Army is treating 2,000,000 pairs of the wartime combat boots of flesh side out with polymeric acrylate and methacrylate materials. These give the shoe a dressy and finished appearance.

For the finishing of leather increased synthetic polymeric materials are used as coatings and binders. New developments are concerned with Buna N type emulsions and Vinylite solutions.

DISINFECTANTS

by ADRIEN S. DuBOIS,
West Disinfecting Co.

UNQUESTIONABLY, the most spectacular development in disinfectants during the past year is the wide acceptance gained by the phenolic compound, bis-(2-hydroxy-3,5,6-trichlorophenyl)-methane, commonly known as G-11.

G-11 as a chemical and a disinfectant has been known for many years. However, it had not been used extensively until is was distributed nationally by a leading soap manufacturer as an ingredient of, not a disinfectant, but a deodorant soap. To be sure, the deodorant properties of the soap are dependent on the antibacterial activity of the G-11, but it is significant that initially, at least, no germicidal claims were made for the soap. This may possibly be ascribed to the manufacturer's belief that a germicidal soap would not have sufficient appeal to find a wide and ready market. However, the almost phenomenal success enjoyed by this deodorant soap seems to point to a large potential demand for an effective germicidal soap. Already, several similar soaps have appeared on the market, and now the field has even been extended to liquid and powdered soaps which are important for industrial and hospital use. In the latter forms, germicidal activity is definitely claimed, and they are reported to effect a 95% reduction to the resident flora of the skin upon continual use. It may be expected that G-11 will contribute effectively, with existing disinfectants and sanitizers, to further enhance the level of sanitation in this country.

QUATERNARIES EXPAND

The quaternary ammonium compounds continue to attract considerable attention and still are the subject of as intense controversies as before. Simultaneously, official figures show that their volume in the past year increased

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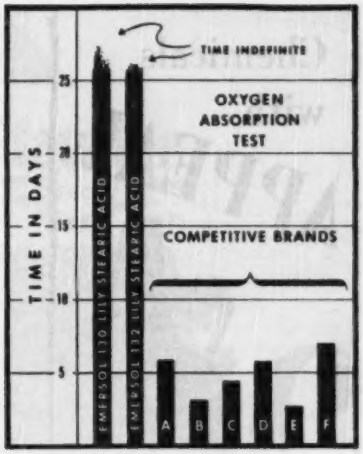

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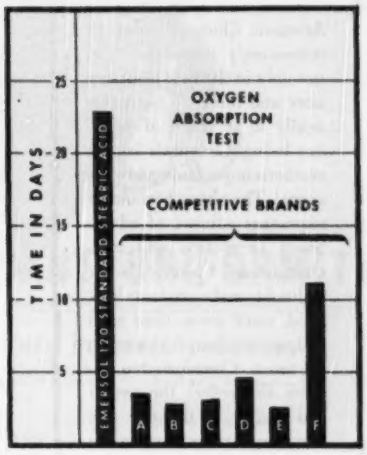

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by more than 50% above that for 1948. Their general acceptance as sanitizers seems to hinge, not particularly on their performance, but more so upon the proper understanding of what a "sanitizer" is expected to do i. e. the definition of "sanitization" itself. Divergent views are held by different interested government agencies, all of which have considerable influence on the manufacturers and users of these products. Briefly, some agencies require that a sanitizer effect only 99.9% killing of the bacteria, i. e. they require reduction of the bacterial population to a safe level, while other agencies insist upon 100% killing, with no live bacteria remaining on the treated surfaces. Interested manufacturers, users and trade associations are striving to clarify this situation and promote adherence to a single terminology.

A factor not to be overlooked in the quarternary ammonium compounds picture is that while the older types of quarternaries have maintained their relatively high price, new materials of comparable potency have appeared at a much lower cost. The preliminary Report of the Tariff Commission for 1949, for example, points out very significantly that the sales unit value decreased from $1.46 in 1948 to $1.29 in 1949. This tendency is sure to become more pronounced in the future, since more and more manufacturers are introducing less costly products.

DETERGENT-SANITIZERS

Subject to the same obstacle as quaternaries—lack of accepted definition —are the detergent-sanitizers. In their most usual compositions, these products are mixtures of quaternary ammonium compounds and non-ionic detergents, with or without alkalies. Even though these materials are not accepted for use as disinfectants, their ability to achieve cleaning and sanitizing in one operation is being recognized in an ever increasing portion of the country. They have proved particularly useful in the dairy industry where they have afforded a solution to sanitation problems which could not be effectively handled by conventional procedures.

While cresylic, coal-tar and chlorine disinfectants have been available to the household retail trade and have enjoyed great popularity for a long time, it is only recently that pine oil disinfectants have similarly made their appearance on the grocer's shelves. This gives the housewife a rather wide selection of efficient disinfectants for general use, the main distinguishing characteristics being their odors, and in the case of pine disinfectants, an antibacterial activity restricted to Gram-negative organisms. Undoubtedly, the latter will find favor with those who object to the more pungent odors of coal tars, chlorine, etc.

Last year's developments are quite significant in that they point to the fact that the disinfectant and soap industries are awake to the retail possibilities of established industrial disinfectants, and that they are seeking new fields to conquer.

HOUSEHOLD INSECTICIDES

by JOHN A. VERSOCKI
Boyle-Midway, Inc.

THE prediction that low-pressure aerosol bombs are here to stay is being borne out by the continuing increase in their sales. DDT-pyrethrum formulae including various synergists predominate in spite of recent adverse publicity. There has been some trend toward aerosol bombs without DDT and such dispensers are now on the market. These bombs contain Pyrenone, a concentrate composed of pyrethrins and piperonyl butoxide in varying concentrations. Toxicity tests have shown this combination to be sufficiently safe to require no caution statement for its use around foods and various pets.

So-called synthetic pyrethrum, or allethrin, as it is now known, has become commercially available a year after its dramatic debut in the laboratories of the Bureau of Entomology and Plant Quarantine. Its manufacture is reportedly a tricky twelve-step process that is expensive. Much investigation is still being carried on by various coordinated teams to determine its insecticidal efficacy against flying insects. Present indications are that allethrin plus a synergist is effective against some of them. It has not yet been approved for aerosols.

Among the allethrin synergists which are under intensive investigation are piperonyl butoxide (3,4-methylenedioxy-6-propyl benzyl diethylene-glycol ether), "264" (N-octyl bicycloheptene dicarboximide), *n*-propyl isome (an isosafrole-*n*-propyl maleate condensation product) and the sulfoxides and sulfones formed by the oxidation of thio ether of safrole and isosafrole.

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aldrin have not yet been approved for aerosol bombs; but chlordane in pressurized cans labelled as surface sprays (a particle size larger than 30 microns) is on the market. A four per cent Lethane bomb, although more or less irritating, has been approved by U. S. Department of Agriculture and some low-pressure insecticidal bombs now on the market contain Lethane. A two per cent Lethane bomb, compounded properly with other active insecticidal ingredients, possesses little or no irritating qualities. Such a formula has been found to be both economical and effective.

Since inert ingredients used in formulation are important, developmental trends in propellents should be considered. The propellents still most widely used are Freon 12 (dichlorodifluoromethane) in high-pressure dispensers and proper mixtures of Freon 11 (trichlorofluoromethane) and Freon 12 in low-pressure bombs. Genetron 102 J may see wider application as it is claimed to possess certain physical characteristics that give it advantages over Freon. Several other propellents such as chloro-fluoro ethanes and propanes have been mentioned in the literature as possible pending completion of toxicity, physical and other tests.

Another significant development in the aerosol field is an aluminum dispenser that several large companies have adopted for low-pressure bombs. Its light weight, appearance and other properties make it an attractive container.

The general trend, due to extensive toxicological studies of pulmonary effects of the various oils used in aerosols, is toward dispensing the least amount of oil in the form of aerosol particles in a given air space with the most biological effectiveness.

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MOTHPROOFERS

Nothing startling has been added to the mothproofing compounds in current use. An interesting possibility exists in that economical mothproofers in combination with a synthetic detergent may soon be developed. Such a product would be desirable as it would clean and mothproof woolens in one operation.

Two products now on the market, however, represent innovations. One, which is similar to wick-type deodorants, contains chlordane and paradichlorobenzene. The user is instructed to unscrew the cap and lift the attached wick one inch above the mouth of the bottle. It is claimed that the fumes will kill moth eggs and larvae. The directions state that one eight-ounce bottle is usually sufficient for one closet or other storage space of approximately 12 cubic feet. Inasmuch as 12 cubic feet is only the capacity of a medium-sized trunk, it is doubtful whether a single bottle of this product would have much lethal effect on either moth or carpet beetle larvae in an ordinary clothes closet. The second wick-type dispenser, a product of the same company, contains liquid tar and paradichlorobenzene. The label states that a half-pint bottle is usually sufficient for 12 cubic feet, and that the product deodorizes cellars, basements, closets, attics, etc. No claims are made regarding any killing effect.

HOUSEHOLD SPRAYS

Sprays containing DDT still outsell other sprays. Lindane, the pure gamma isomer of benzene hexachloride, is permitted in 0.10% concentration with proper directions for its use. Aldrin, dieldrin, and heptachlor have not been approved as yet in household sprays.

There seems to be some trend toward non-DDT sprays although DDT sprays, used according to directions, are still mostly in demand.

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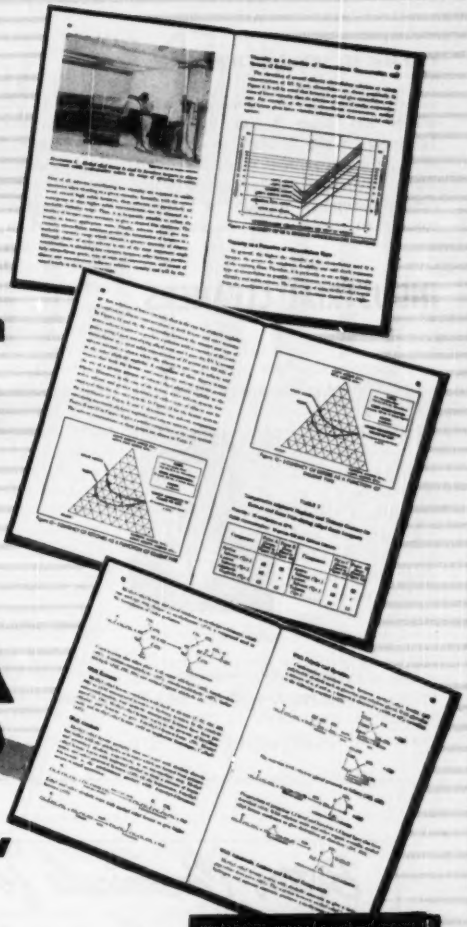

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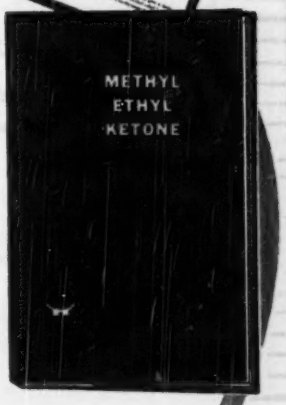

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as an insecticide is scabrin, an amide which has been found by Martin Jacobson of the USDA in the roots of a native perennial weed, *Heliopsis scaba*, commonly called ox-eye. Preliminary reports indicate it is more toxic than pyrethrum to houseflies.

INDUSTRIAL CLEANERS

by H. R. SUTER
Associate Director of Research
Wyandotte Chemicals Corp.

THE past year has seen steady progress in improvement of specialized cleaning materials and in methods for their application rather than discovery of any revolutionary new materials or principles.

Use of synthetic detergents has continued to increase. Much of the substantial expansion in production capacity of the past two years is now utilized. Alkyl aryl sulfonates continue to predominate in general industrial usage; however, a variety of other types fulfill special requirements. Nonionics, notably condensation products of alkyl phenols, fatty acids, rosin acids and alkyl mercaptans with ethylene oxide, are assuming greater importance in spite of their liquid physical form, which limits their application in some instances. Price reductions have been made during the year which will undoubtedly accelerate this trend. Sodium carboxymethyl cellulose has shared in the general growth of synthetics, one of its principal uses being as an additive in heavy-duty laundry compositions.

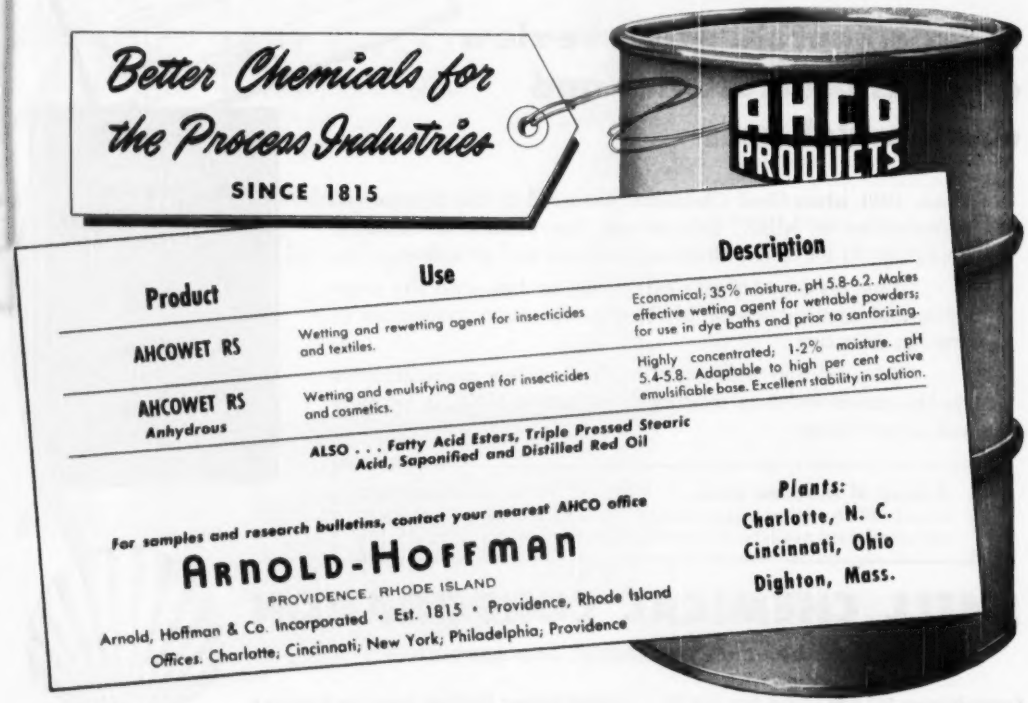
Sales of specialized industrial cleaners have followed, as always, the trends of activity in the principal consuming industries—metal fabrication and finishing, laundering and textile processing, food and beverage processing and serving, building and equipment maintenance and transportation. The gradual decline which characterized the preceding year was arrested early in 1950 and since that time a steady increase in volume has been the general rule. Currently, the military preparedness program is bringing about increasing requirements for specialty products, such as solvent-type paint strippers for aircraft, aluminum brighteners and deoxidizers, carbon removers for engine parts, cartridge case cleaners, etc.

ON FIRM GROUND

A number of new developments which have been announced previously have reached the firm ground of commercial acceptance. Among these are detergent-sanitizers based on quaternary ammonium compounds and nonionic detergents, which are actively being sold in the dairy industry, and detergents inhibited against attack on glass surfaces which are being sold for bottle washing and for washing of laboratory glassware.

Organic chelating agents such as ethylene diamine tetra acetic acid, are being offered to the detergent compounding industry as water softening agents in competition with polyphosphates. To the present, the principal use has been in liquid soaps.

There has been a considerable intensification of the efforts of scientific and trade organizations as well as government agencies in developing and establishing performance testing pro-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cedures for various classes of detergents, and in the improvement of standards and practices relative to their use. The National Security Industrial Association has established a committee representing the detergent industry to assist the armed services in these matters. The committee has begun active work on a number of specific projects of immediate concern to the services, including the preparation of comprehensive manuals covering industrial cleaning operations, choice of standard soiled cloth for the evaluation of laundry detergents, development of bar detergents suitable for use in salt water, development of improved metal degreasing compositions and methods for their evaluation, and others. The American Society for Testing Materials is continuing and extending their efforts toward establishment of specifications and general testing procedures. The American Chemical Society, the American Oil Chemists' Society, the American Association of Textile Chemists and Colorists, the Chemical Specialties Manufacturers Association and other groups have held symposia on detergents and the measurement of detergency.

Several important contributions have appeared in scientific literature on the application of radioactive tracers to detergent problems. This development, however, is considered to be in its infancy and may be expected to bear fruit in the way of practical applications over a period of years as the fund of fundamental information is accumulated. Industry will help in adding to that fund.

SPECIALTIES NEWS

Food Study by Congress, NAC Offers Aid

The National Agricultural Chemicals Association will cooperate with the House Committee authorized by the passage of the Sabath Resolution (H. R. 323), according to Lea S. Hitchner, executive secretary.

The Resolution authorizes a committee, composed of seven members of the House of Representatives, appointed by the Speaker, to direct and conduct a full and complete investigation and study of the use of various chemicals and compounds in the production, processing, preparation, and packaging of food products. Committee activity is scheduled to consist of three phases, one of which includes insecticides and related materials.

"Just as the National Agricultural Chemicals Association offered its facilities and cooperation to the Food and Drug Administration at the on-set of the current Residue Tolerance Hearings, which began January 17, this association extends its services to the Congressional Committee, and will provide such information and data as may be available," Mr. Hitchner said.

H. R. 323 was passed June 20, 1950, and it is expected that the Committee authorized by the Resolution will be appointed shortly.

New Rodenticide Released For Consumer Sale

Warfarin, a chemical which laboratory and field tests have proved to be a safe and effective means of rodent control, has been released for general consumer sale. It was previously known as W.A.R.F. 42 or Compound 42 until the adoption of the common name Warfarin by the Interdepartmental Committee on Pest Control.

The new rodent killer, developed in the laboratory of Dr. Karl Paul Link of the University of Wisconsin (*CI, July 1949, p. 31*), kills rats and mice by producing hemorrhage. It differs from most other rodenticides in that it is a slow-acting poison. To kill, it must be consumed by the rodent over several days' time.

However, because warfarin, in the concentrations used in baits, is tasteless and odorless to rodents, rats and mice do not develop bait shyness and continue eating bait containing it until enough has been consumed to cause death. As a result, warfarin rodenticides will, in most cases, successfully control a rat and mouse population and then serve to prevent a rebuilding of that population by killing newcomers as they arrive.

Several hundred field tests, carried out in a nationwide testing program initiated in September, 1949, have demonstrated the outstanding effectiveness of warfarin rodenticides in the killing of rats (both Norway and roof) and mice. These were conducted under an experimental permit issued by the Production and Marketing Administration of the U. S. Department of Agriculture at that time. This large-scale testing program on Warfarin rodenticides was conducted jointly by S. B. Penick and Co., R. J. Prentiss and Co., Inc., and the Wisconsin Alumni Research foundation, in cooperation with the Production and Marketing Administration of the U. S. Department of Agriculture, the Fish and Wildlife Service, the U. S. Public Health Service and the National Pest Control Association. The program is the first in which users of rodenticides were requested to report results achieved.

Warfarin is protected by a patent owned by the Wisconsin Alumni Research foundation. S. B. Penick and Co., and R. J. Prentiss and Co., Inc., both of New York City, are two firms which will handle the distribution of the rodenticide in various fields. It is available to the trade for professional use for packaging under private label for consumer use or for manufacture into prepared baits.

J. Stanley Hall (left), manager of the Laundry and Dry Cleaning Dept., Pennsylvania Salt Manufacturing Co., elected president of the Laundry and Cleaners Allied Trades Association; and John W. Kennedy, named district manager of the Kolker Chemical Works. Mr. Kennedy will make his headquarters at the Houston, Texas, plant.

"What's New" Memo

Do you know the advantages of polyethylene as a packaging material for your products? Do you make greases, use thickeners for organic solvents in your formulations? Does a resin for wet-strength paper interst you?

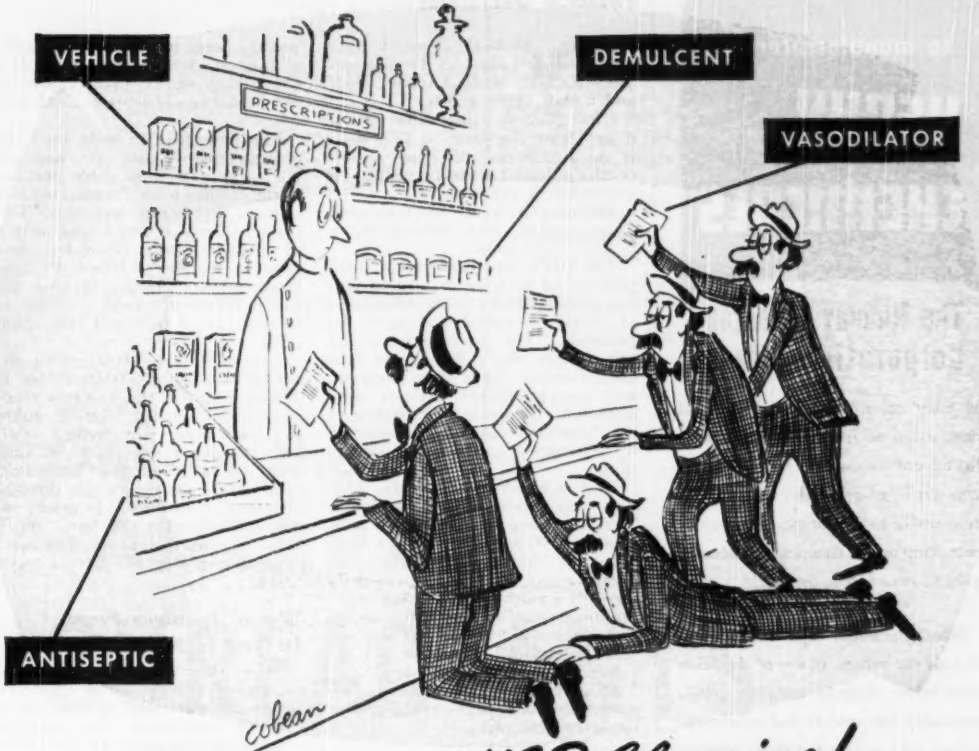
You'll want to read the latest on these materials in these articles in this issue:

"Polyethylene Progress," p. 177.
"Headbox Hero," p. 178.
"Metamorphosed Clay," p. 180.

Antihistamine Study Shows Four Ineffective

Four antihistaminic drugs—thonzylamine, chloroprophen-pyridamine doxylamine and pyrathiazine—were found to be ineffective in preventing or relieving the symptoms of the "common cold" in a study recently completed at the U. S. Naval Training Center, Great Lakes, Ill.

A total of 1,964 persons were included in the study, conducted at



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TODAY—*one out of every four* prescriptions calls for U.S.P. Glycerine in some form—so our illustration is not so facetious as you might suspect! In dermatological preparations, for example, the low evaporation loss and unusual viscosity of Glycerine solutions help retain active materials upon involved surfaces for longer periods. Certain of its derivatives are well known heart stimulants. As a solvent, U.S.P. Glycerine is often more efficacious than water or alcohol. In Medicine and Pharmacy, it has long been established that U.S.P. Glycerine is *safe* to use, and that its unusual combination of chemical and physical properties can be matched by no other product. If you'd like to know more about Glycerine usage in pharmaceuticals—as well as in the cosmetic field—mail the attached coupon for your copy of *"Why Glycerine for Drugs and Cosmetics?"*

TOMORROW promises even wider applications for U.S.P. Glycerine in the pharmaceutical field! The National Formulary Committee has already indicated that U.S.P. Glycerine is preferable to any substitute in its original formulas . . . and Glycerine's unique properties—singly or in combination—are expediting the development of hundreds of new compounds. By way of illustration, progress made in the treatment of anemia through the application of ferrous gluconate, has not found Glycerine wanting. In a recent paper on the subject, it was pointed out that ferrous gluconate is far more soluble in a Glycerine vehicle which also tends to retard oxidation to a greater degree—thus producing a more effective elixir. Full details are available on request. (Please use your company letterhead.) Once again, here's proof that—*nothing takes the place of Glycerine!*

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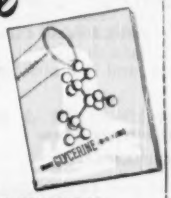

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the Naval Medical Research Unit No. 4, Great Lakes, by Commander John R. Seal, Medical Corps, USN, and a staff of assistants.

One general conclusion to be drawn from the study is that there is no significant difference in the results obtained when prevention or treatment of the "common cold" is undertaken with the antihistaminic drugs studied, inert substances, or typical "cold tablets."

The study was carried out upon persons of both sexes and various age groups drawn from volunteers of Naval personnel and their dependents. The investigations did not explore the value of the four antihistaminic drugs upon allergies; and known allergic patients were excluded. Evidence of existence of the "common cold" was confirmed by laboratory and clinical procedures.

In one phase of the study, 1,103 men were divided into three groups. The first group of 352 received daily doses of 100 milligrams of an antihistamine drug; members of the second group of 337 were given daily doses of a placebo (a harmless preparation resembling the antihistamine in appearance but without any effect); the third group of 414 received no medication of any kind. No significant difference in the incidence of colds in the three groups could be detected.

Hercules to Build Second Toxaphene Unit

Hercules Powder Co. will build a second unit for the manufacture of toxaphene, the chlorinated-camphene insecticide used in killing the cotton boll weevil and other crop and livestock pests. The new plant, to be located at Hattiesburg, Miss., is expected to increase production of toxaphene by almost 50 per cent. The company's other plant at Brunswick, Ga., has been in operation since 1947.

Construction is expected to begin immediately, with the plant expected to be ready for use by February. This means that the unit should be in production in time for control of insects on 1951 crops.

Hattiesburg was selected as the site to bring the product closer to the vast cotton-growing regions of the Mississippi Delta, Arkansas, Louisiana, and Texas. The Hercules naval stores plant, located there since 1920, will furnish power, steam, laboratories and supervisory personnel.

FDA Approves New Anticoccidial Drug

The Food and Drug Administration has approved use of a new Dow Chemical Co. drug, Parabis-90, in poultry feeds to prevent coccidiosis, a disease which causes upward of $10 million annual poultry loss. It can be fed to chickens until slaughter.

The new drug in wide tests has proved effective and safe, and will not carry over into edible portions of the chicken even if medicated feed is given just before slaughter. This permits use of a single feed instead of requiring non-medicated feed prior to slaughter. It will be marketed to feed companies who will add it to chicken feed. Enough to treat a ton of feed will cost about $2.00.

Parabis-90 saw extensive and successful trial with 200,000 chicks in Michigan during the past two years, according to Dow's Julius E. Johnson who supervised feeding trials with the new product, and national trial was held up pending federal approval for the drug's sale through interstate commerce. Johnson explains that chicks are fed a medicated feed from the time they are a day old to protect them from coccidiosis.

Turco Acquires Plant In New Jersey

As a major step in a continuing expansion program, Turco Products, Inc., manufacturer of industrial cleaning compounds, has acquired a large eastern plant at 120 Lister Ave., Newark, N. J. It will serve as a manufacturing and laboratory center for Turco's Atlantic Division.

Six major buildings covering 58,000 square feet and the 950,000-gallon storage capacity of the new three-acre site approximately double the company's manufacturing capacity. Located adjacent to the Pulaski Skyway and the main line of the Pennsylvania, the new factory has an in-the-plant spur line connecting to all major rail facilities, as well as complete dock and lighterage facilities on the Passaic River.

This expansion is the second in a planned series of three. The first was the activation of a liquid manufacturing plant at McCook, Ill., last year, and the third is construction of a large west coast factory on a recently acquired ten-acre site in the central manufacturing district of Los Angeles.

Free Premiums Violate Fair Trade

A recent ruling in the Superior Court of New Jersey found that a drug store offering a $2.50 cigarette lighter free with the purchase of trade marked products for which there are established prices was in effect selling at less than established prices. The case involved E. R. Squibb & Sons, which had obtained

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an injunction prohibiting a retailer, Charline's Cut Rate, Inc., Summit, N. J., from cutting prices on Squibb products. The retailer was held in contempt of court because he had advertised that a lighter of $2.50 value would be given free with every purchase of $2.00 or more, and was fined.

Johnson Grass Builds Resistance to 2,4-D

Suspicious of surviving Johnson grass plants in sugarcane fields treated with 2,4-D, agronomists of the U.S. Department of Agriculture found that the next generation grown from the seeds of these surviving plants was twice as resistant to the 2,4-D as those of the previous generation. Johnson grass, introduced into the South as a forage crop more than a century ago, has spread widely as a weed in cane and cotton fields.

Research men in the Division of Sugar Plant Investigations found that 2,4-D applied on the soil surface at the low rate of 2 pounds to the acre reduced the emergence of Johnson grass seedlings (and other weeds, too, including tie vines and alligator weed) by 85 to 95 per cent and had no bad effect on the sugarcane sprouting or growth. But they saved the seed of surviving Johnson grass plants and grew it to see how the plants from this seed would react to the 2,4-D treatment.

As a result of their findings, it now appears that chemical weed control is another field in which agricultural science must always look for something new, just as it has had to do in meeting the attacks of fungi and bacteria, and just as the entomologists have had to do in the fight on house fly strains showing resistance to DDT.

New Greenhouse Built for Radioactive Research

The U. S. Atomic Energy Commission and the U. S. Department of Agriculture have completed a specially designed greenhouse at Plant Industry Station, Beltsville, Md., for research in plants and soils with radioactive isotopes.

This research will provide new and valuable information on many fundamental aspects of soils and plant nutrition. Studies using radioactive phosphorus have already established basic facts showing how different crop plants make use of this element in varied types of soils. These tracer studies by USDA, in cooperation with the AEC and State agricultural experiment stations, have been in progress for the past three years.

The new building, erected at a cost of about $250,000, will permit an expansion of the cooperative investigations with radioactive elements. The work will be enlarged to include other radioactive elements. Calcium, zinc, and sulphur will be used in the near future. Because of radiation hazards, the building and surrounding land will be restricted to workers trained in the necessary precautions.

Although the exterior of the new structure looks like other greenhouses at Plant Industry Station, inside the new building are many distinctive features that mark it as specially designed for studies with radioactivity. For example, stainless steel plates line the large double doors to the basement section where highly radioactive materials, mostly from Oak Ridge, will be received, given initial preparation, and maintained until put to use in the investigations.

Searle Starts Final Wing Of Research Building

G. D. Searle & Co., Chicago, has just started construction on a new section of its Research Building. This is the final wing completing the ultimate plan for this structure. The architecture of the addition will follow the identical tone of the main structure.

The structure will consist of one story and full basement providing approximately 20,000 square feet of new area. Within this area will be fourteen new laboratories, to be devoted to research in synthetic organic chemistry and several fields of biology. In addition there will be a number of departmental offices and an extensive service area for stock rooms and areas for special technical equipment.

Toxaphene Bulletin

The USDA Bureau of Entomology and Plant Quarantine has just issued *A Digest of Information on Toxaphene*, by R. C. Roark, of the Division of Insecticide Investigations. This is designated Bulletin E-802, June 1950. It covers toxaphene's chemistry, formulations, compatibility, freight classification, effect on plants effect on animals, and use as an insecticide. There are 334 references.

Anticorrosive Paint Formulas Available

Two fast drying red lead anticorrosive paints of the vinyl and coumarone types are featured in Red Lead Technical Letter No. 5, just published by the Lead Industries Association, 420 Lexington Ave., New York 17, N. Y. Free copies may be obtained upon request to the association.

The red lead-vinyl coating is especially suited for protection of steel surfaces exposed to fresh and salt water and to highly corrosive atmospheric environments. It can be recoated in one hour. A detailed formula is presented meeting the requirements of U. S. Coast Guard Specification CGS-52P-4.

The red lead-coumarone paint is designed for use with a variety of antifouling paints for the protection of steel ship bottoms and continuously immersed marine structures. It can be applied by brushing or spraying and can be recoated within a working day.

Carl Peterson (left), named works manager of Connecticut Chemical Research Corp.; and Joseph H. Brant, appointed director of research for The Toni Co. of Chicago. Mr. Peterson was formerly general manager of the Dormeyer Corp. and Dr. Brant was director of research for Bates Manufacturing Co.

Corrosion Short Course

Nine two to two and one-half hour lecture periods, with adequate time for discussion, have been scheduled tentatively at Cleveland, Ohio, for the Case Institute of Technology corrosion short course to be held September 25-29. The lecture course is designed as a refresher for those actively engaged in corrosion prevention, yet will not be too advanced for those just entering the field. The National Association of Corrosion Engineers is cooperating in the undertaking.

Authorities in the field of corrosion and corrosion prevention have accepted invitations to serve as lecturers. Further information and official application blanks will be available on request from R. B. Hoxeng, Case Institute of Technology, Cleveland 6, Ohio.

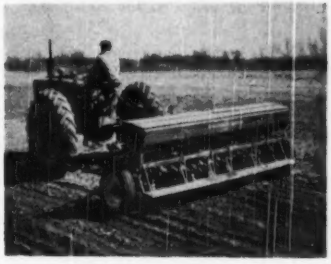
Company Notes

• **Balassa Research Laboratories** (formerly L. Balassa & Associates), New York, and West Barrington, R. I., has acquired space in the former office building of Naushon Mills, Inc., at 59 Cove Street, New Bedford, Mass., where a new research and development laboratory now is under construction. The new unit will be engaged principally in cellulose and textile research. Scheduled to be in operation in a few

The Philosopher's Stone

In the Middle Ages the alchemists sought to make—with the aid of Sulphur—a wondrous thing called the "philosopher's stone". With this "stone", they planned to work miracles of many kinds. They hoped, by touching it to base metals, to convert those metals into precious gold.

Although the alchemists' dreams for Sulphur were never realized, Sulphur adds to mankind's natural wealth through its role in fertilizer. It enhances the earth's riches by helping to convert air and soil constituents into growing plants. Sulphur is used not only in the form of sulphuric acid for the manufacture of most fertilizers but also as an ingredient in many of them to correct soil deficiencies. Thus, through increased yield from our agricultural lands, Sulphur makes another basic contribution to supplying the world's necessities.



FREEPORT SULPHUR COMPANY, *oldest United States producer of crude sulphur, has been supplying this essential raw material for over 35 years.*

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months, the new laboratory also will undertake some projects on plastics and starches.

Bulk of the company's work on paints, pigments, adhesives, construction and equipment design will continue in the organization's present laboratories in Rhode Island, New York and New Jersey.

• **The California Spray-Chemical Corp.** has launched an expansion program for laboratory and field research on agricultural pest control chemicals for 1950 and 1951. New field laboratories have been established at Janesville, Wisconsin; Uvalde, Texas, and Orlando, Florida, supplementing laboratories previously established in various parts ot the country.

• **Catalin Corp. of America** has begun operations at its modern, new plant at Calumet City, Ill. Site of the new plant includes dock facilities on the Calumet River.

The new plant is now producing a full range of phenolic, melamine, urea and resorcinol resins for gluing, laminating, crease proofing, bonding and impregnating processes.

Catalin has also acquired land and has installed large capacity, low-temperature, storage tank facilities at Thomasville, N. C.

• **Sharp & Dohme Inter-American Corp.** has opened a new branch in Caracas, capital city of Venezuela. To expedite customers' receipt of goods, many Sharp & Dohme products will be flown to the various Venezuelan cities of the coast and interior.

• **Emergency shipment** of huge quantities of orthodichlorobenzene is being made by The Dow Chemical Co. for the USDA Forest Service in Colorado to spray $90 million worth of timber infested with bark beetle. Initial shipment was 100,000 pounds; total amount shipped may reach 700,000 pounds.

• **To be closer to its research and manufacturing activities,** George A. Breon & Co. is moving its executive and administrative offices from Kansas City to New York, N. Y. The new addres of the firm will be 1450 Broadway, headquarters for virtually all of the domestic divisions and subsidiaries of Sterling Drug.

• **Another sign** of low-pressure aerosol growth: The five millionth can of Hep aerosol insecticide recently rolled off the assembly line at Bostwick Laboratories, Inc., Bridgeport, Conn.

• **Millmaster Chemical Corp.** has become exclusive sales agent for F. W. Berk & Co.'s Emjeo and other fertilizer materials.

NEW CHEMICAL SPECIALTIES

Note: This section limited to new finished specialties. New raw materials and intermediates of interest to specialties manufacturers are described in New Products and Processes department.

Hydraulic Fluid

Product is flame-resistant, has high lubricity.

A flame-resistant industrial hydraulic fluid, also said to have high lubricity, has been developed by Monsanto Chemical Co., St. Louis 4, Mo. The fluid, designated as OS-16, has been thoroughly field-tested in hydraulically-operated mining equipment.

In the tests, a coal-cutting machine was operated on a 24-hour, three-day week in underground mining service. Hydraulic pressure was 1500 psi. A complete examination at the conclusion of the test showed no signs of wear in the hydraulic system, pumps or other moving parts in contact with OS-16.

Because the fluid is an ester-base compound containing no halogenated hydrocarbons, salts or water, it will not corrode bearings or other metal parts, and is a non-conductor of electricity. Tests also show that OS-16 does not irritate the skin, and requires no special precautions in handling or use.

Mothproofer

Mothproofing chemical used during manufacture of woolen yarn or goods.

Lanoc is the name of a new mothproofing chemical being sold by Canadian Industries Ltd., Montreal, Canada, for use during the manufacture of wool yarn or goods. It is sodium dihydroxy-pentachlorotriphenylmethane. Applied in a dye bath during processing, Lanoc makes wool fiber unpalatable to the larvae of moths and carpet beetles.

Aluminum Etching Compound

Concentrated alkaline material does not form hard sludge deposits.

Pennsalt AE-18, a new, highly concentrated alkaline compound for etching aluminum without forming hard sludge deposits on the bottom of the etching tanks is now being offered by the Special Chemicals Department of the Pennsylvania Salt Manufacturing Co., 1000 Widener Bldg., Philadelphia.

The new etching compound is the result of considerable research at Pennsalt's Whitemarsh Research Laboratories to develop a product which would give a bath of long life, assure uniform etching, and at the same time avoid the rock-like sludge deposits. Research work was followed by extensive field tests.

Packaged in a 300-pound non-returnable drum Pennsalt AE-18 is recommended for use in concentrations of five to seven ounces per gallon of water at temperatures of 140° to 150°F. Depending upon the degree of etch desired, the parts may be immersed for 30 seconds to 10 minutes, followed by rinsing in a clear water dip or spray.

A titration chart and other information may be obtained from the company.

Fuel Oil Additive

Liquid's homogenizing action gives clean, complete oil burner combustion.

A flash point of over 200°F. is one of the distinctive features of Instant Acting Sabanol, "the Homogenizing Fuel Oil Treatment," developed by American Sand-Banum Co., Inc., 9 Rockefeller Plaza, New York 20, N. Y. It is said to be a safe and certain means for clean and complete combustion in oil burners since it is non-toxic and non-explosive. It is a neutral liquid concentrate free of abrasives, benzene, petroleum solvents, alcohol, ether, carbon tetrachloride or any other chlorinated solvents.

Sabanol disperses sludge and water in the oil, holding in suspension for maximum burnability. Further, it softens and then disintegrates any adhering, existing sludge. Thus this, too, is burned. Time, expense and damage of mechanical cleanings are eliminated.

Sabanol also contains a soot retardant and rust inhibitor, likewise effective in all grades of fuel oil.

Car Finish

Clear finish for autos has high wear and abrasion resistance.

Lustre-Lox is the trade name of the clear spray-on type automotive finish which D. B. A. Associated Chemists, Inc., 1525 S. W. Alder St., Portland, Ore. is now selling in the Portland-San Francisco area. The product, which retails at $3.75 per quart, is being distributed mainly through car dealers and paint shops. The finish can be applied with a pressure spray gun in about 20 minutes. It does not throw colors off shade, and gives a clear film that is non-porous, heat and cold resistant, and does not waterspot. Excellent results in comparative tests against well-known car finishes of the film-forming type are the basis for its sales slogan, "It's torture-tested".

The new product can be used under paint as well as over it, and can be used as an undercoat or

NEED SURFACE ACTIVE AGENTS?

Oronite offers a wide variety to solve most any problem

ORONITE WETTING AGENT. An anionic type wetting agent, light brown, semi-fluid, and completely soluble in water. Forms solutions which foam readily and have low surface and interfacial tensions, as well as other characteristics requisite for rapid wetting time and quick penetration.

ORONITE WETTING AGENT "S". A recently introduced anionic surface active agent containing high active content of akyl aryl sulfonates and low salt content. It is a cream colored slurry possessing high detergency coupled with excellent surface tension depression, rapid wetting, good suspension and emulsification.

DETERGENTS. While principally sold for detergent purposes, these products are also emulsifiers and surface active agents of the akyl aryl sulfonate type. They are available in three forms: (1) D-40, dry, white flake (neutral, 40% alcohol soluble), (2) Slurry, and (3) Alkane, a clear liquid hydrocarbon intermediate for processing into various detergent forms.

SODIUM SULFONATES. Oronite Sodium Sulfonates are available in several grades to meet a wide range of technical requirements. Each has been carefully tested and established to comply with actual industrial applications. Oronite Sulfonate No. 4 is a dark brown liquid, completely water-soluble and slightly soluble in mineral oil; No. 5 is an oil-soluble, surface active agent of heavy consistency and slight water dispersibility; No. 6 is a brown, free-pouring liquid which is miscible in all proportions with water and insoluble in hydrocarbons. Oronite Purified Sulfonate is predominately oil-soluble and only partially water-soluble.

NAPHTHENIC ACIDS. Organic acids containing a substituted naphthene ring structure, Oronite Naphthenic Acids find large scale application in the manufacture of soaps, emulsifiers, greases, water-soluble oil, wood preservatives and paint and varnish driers. They are useful as flotation agents of "non-sulphide" type ores and also as additives for castor machine oils. Available in five grades.

CRESYLIC ACIDS. Clear, reddish-brown liquids, of four grades varying in boiling ranges. They are partially soluble in water; immediately soluble in alcohol, ether, and hydrocarbon solvents. Cresylic Acids are excellent solvents of various organic substances, and are used as active ingredients of so-called "carbon stripping" compounds. Another surface active usage of Cresylic Acids is the flotation process recovery of copper and gold.

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30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.
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Hydroformer Catalyst • Ortho and Para Xylenes

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THE NAME TO WATCH IN CHEMICALS

preservative. It can be used on enamel, lacquer, steel, aluminum, copper, and brass. One of the large truck freighters is using it on its aluminum body trucks and trailers. National distribution is planned at a later date.

Metal Cleaner

Self-emulsifying solvent can be used as is or in emulsion form.

S.E.C. Solvent Emulsion Cleaner has been introduced by Chemclean Products Corp., 64 Sixth Ave., New York 13, N. Y. It is a self-emulsifying solvent said to have particularly fast wetting, rapid penetrating, and free rinsing properties that insure wetting recesses, and loosening the bond between basic metals and soils. Used as a presoak, it removes buffing compounds, drawing oils and compounds, sulphurized and chlorinated cutting oils, greases and soaps.

Compatible with alkaline cleaners and chlorinated degreasers, it can be used at room temperature to 140° F., as is; or in the form of an emulsion at 1-1 or 1-2 parts water. As a spray, it can be used as is, or in the form of an emulsion up to 1-20 parts water, from room temperature to 140° F.

It is claimed to be non-toxic and practically odorless, and not to attack metals.

Vinyl Adhesive

Emulsion laminates vinyl sheeting to porous surfaces.

A new water thinnable emulsion type adhesive for adhering vinyl sheeting to porous surfaces has been developed by Thomas W. Dunn Co., Pearl and Dover, New York 7, N.Y. Called Dunn's Vinyl-Hesive, it will bond all flexible formulations of vinyl sheeting to paper, pressboard, cardboard, masonites, felt and other porous surfaces.

Because the material is non-staining, the number of rejects (due to discoloration of the vinyl) is very low. The dried adhesive is extremely resistant to aliphatic hydrocarbons, oils, greases, water and to deterioration by bacteria and fungi.

Vinyl-Hesive is expected to find wide application in the food packaging industries since it is relatively non-toxic. Reports from major distributors of vinyl sheet stock indicate that this adhesive should open large fields for supported vinyl sheet stock.

Insect Spray

House plant insecticide in squeezable bottle.

Killing bugs on house plants is made more convenient with Spray-Away, a product of the Bulb of the Month Club, Chicago 90, Ill. Spray-Away, priced at $1.25, is packaged in the unbreakable Plaxpak polyethylene bottle. User simply flips up the cap, aims and squeezes. Out comes a mist containing DDT, rotenone, and methyl naphthalenes. Self-atomizing feature of bottle integrates package and product into a handy household gardening accessory. Bottles are manufactured by the Plax Corporation, Hartford, Conn.

Anti-Skinning Agents

Two new paint materials useful where odor and color must be considered.

Two new anti-skinning agents for paints and varnishes have just been introduced by the Naval Stores Division of the Glidden Co., Cleveland, Ohio. Supplementing Guai-A-Phene, Glidden anti-skinning agent which has been on the market for several years, the two new agents are Glidcol-Regular and Glidcol-WW.

Glidcol-WW is the agent recommended for protective coatings where the agent used must have a very light color and mild pleasant odor. Its low boiling range insures evaporation from the film with minimum drying retardation. It will not discolor even the whitest paint.

Glidcol-Regular is middleground runner of the trio. Its odor is stronger and its color darker than Glidcol-WW but its effectiveness index is 85 points, five points higher than Glidcol-WW. Research has shown that when odors become milder, anti-skinning qualities become weaker.

Guai-A-Phene, an effective and economical anti-skinning agent, possesses a rather pungent odor and dark color. Where odor and color are not a problem, Guai-A-Phene is recommended as a skinning countermeasure.

All three Glidden anti-skinning agents are complex organic compounds including wood phenols. Users are cautioned that it is necessary to decide on the basis of tests the correct proportion of the agents best suited for particular formulation.

• **Pronestyl Hydrochloride,** a new drug said to be a powerful addition to the therapeutic agents hitherto available for the treatment of cardiac conditions, has been placed upon the market by E. R. Squibb & Sons. This new drug, the monohydrochloride of p-amino-N-(2-diethylaminoethyl) benzamide, is described by clinical investigators as effective and safe to use in abolishing certain irregular rhythms of the heart known as "ventricular tachycardias." These annoying heartbeats, though not dangerous, are frequently the cause of anxiety on the part of people who experience them.

It is supplied in 0.25 Gm. capsules in bottles of 100 and 1000; in solution, 100 mg. per cc., in 10 cc. vials.

• Teac-90, an organic liquid introduced by Process Chemical Specialties, Beverly, Mass., about a year ago as an industrial product (it functions as a sequestrant and solubilizer), is showing promise as a **plant growth aid** in preliminary tests. Three to four waterings of plants with a 0.05% to 0.1% solution of the material in water accelerate growth, minimize trans-planting shock, and increase resistance to wilting. Tests with Teac-90 indicate that it increases and accelerates seed germination.

• **An 8-color assortment** of drawing inks in trial size bottles handsomely boxed has been introduced by Higgins Ink Co., Inc., 271 Ninth St., Brooklyn 15, N. Y. The set is suitable for the "man in the street" as well as artist, student or hobbyist. It will retail at $1.20 thus adding price appeal to other factors. This is the first time Higgins have bottled its colors for domestic consumption in smaller than their standard ¾ oz. desk size.

• **'Aspivite' Capsules,** a protective analgesic preparation for relief of headache, neuralgia and muscular pains and effective in treatment of rheumatic fever, rheumatic polyarthritis, rheumatoid arthritis and intra-ocular inflammation has been released for national distribution by Sharp & Dohme, Inc., Philadelphia. Each capsule contains 0.3 Gm. acetylsalicylic acid, 0.35 mg. menadione and 35 mg. ascorbic acid.

Dosage is adjusted to the individual and may vary from one to 30 capsules daily. The capsules are supplied in bottles of 100 and 1000.

• **Isuprel hydrochloride,** the bronchodilator related to, but more potent than epinephrine, has been introduced to physicians by Winthrop-Stearns Inc. in a new 1:100 (1 per cent) solution. The original 1:200 (0.5 per cent) solution is being continued. Both are suitable for treatment of bronchial asthma.

• **Avertin Fluid** (tribromoethanol with amylene hydrate), a drug manufactured by Winthrop-Stearns Inc., 170 Varick St., New York, N. Y., has been reported as "completely eliminating fear of operations" when administered by rectum for basal anesthesia combined with ether by inhalation. It is indicated to be of value for nervous and young patients.

DRYMET*

THE ECONOMICAL DETERGENT SILICATE

Cowles DRYMET, anhydrous sodium metasilicate, is the most highly concentrated form of sodium metasilicate available. It is more economical to use, on the basis of both Na_2O (alkalinity) and SiO_2 (silicate) than any other type of hydrated or anhydrous detergent silicate, either compounded or by itself. DRYMET contains no water of crystallization.

DRYSEQ*

THE ALL-PURPOSE DETERGENT SILICATE

Cowles DRYSEQ, anhydrous sodium sesquisilicate, is a medium pH alkaline cleaner which will do fast, dependable work at a low cost to the user. It is a white, free-flowing powder, quickly and completely soluble in hot or cold water—containing 56.75% Na_2O—making it an economical base material for compounding.

DRYORTH*

THE HEAVY-DUTY DETERGENT SILICATE

Cowles DRYORTH, anhydrous sodium orthosilicate, is a powerful, speedy, heavy-duty cleaner with valuable penetrating and wetting-out properties, reinforced dirt-removing power and unusual emulsifying action. It is an anhydrous, free-flowing powdered silicate containing not less than 60% Na_2O, which may also be used as an economical constituent of high pH cleaning compounds.

CRYSTAMET*

THE MEDIUM pH DETERGENT SILICATE

Cowles CRYSTAMET is a pure, perfectly white, free-flowing granular pentahydrate sodium metasilicate with the normal 42% water of crystallization. Suggested for compounding when it is desirable to lower the concentration of a finished product. Readily soluble—chemically stable—easy to handle. Can be used on medium pH jobs.

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TRADE MARKS OF THE MONTH

From Official Gazette—Vol. 632, No. 4, and Vol. 633, Nos. 1, 2, 3.

BUFFEX. Compounds of sodium hydroxide and bromide sale for disinfecting swimming pool water. 570,442. American Swimming Pool Co.

FMG FRANK'S MARKET GARDEN FOR MORE GROWTH. Fertilizers. 570,563. Frank's Market Garden.

TRICLENE. Liquid metal degreasing solvents. 571,015. E. I. du Pont de Nemours & Co.

Kleensweet. Liquid air deodorizer. 571,561. Liquid Veneer Corp.

ACTOPHOS. Phosphates for application in municipal and industrial water distribution systems for inhibiting scale. 571,631. W. H. & L. D. Betz.

Prozite. Buffing compositions, liquid abrasives, sized and graded grits, cleaning abrasives for use in soaps and wetting agents, and deburring compositions. 572,201. Poor & Co.

Garden Witch. Insecticide. 572,361. Interstate Medical Co.

POLYZIME. Desizing agent. 572,603. Takamine Lab., Inc.

BRU-CEX. Water softener. 572,632. Bruner Corp.

DAZZLE. Ammonia for washing and general cleaning and liquid laundry starch. 573,051. J. L. Prescott Co.

FORMULA X-68. Disinfectant particularly adapted for hospital use. 573,269. John Sexton & Co.

Thur-O-aire. Room deodorizer. 573,678. Rex Research Corp.

FORMULA 27. Germicide, disinfectant, and deodorant in concentrated liquid form. 573,798. John Sexton & Co.

(Symbol) Pressure-sensitive adhesive tape. 574,783. Minnesota Mining & Mfg. Co.

De-Moist. Desiccant and dehumidifier. 574,897. G. N. Coughlan Co.

Pace. Paints, varnishes, wood and varnish stains and paint colors in paste and powder form. 575,012. Pace Paints Inc.

POWCO. Insecticides, fungicides, germicides, pesticides, and disinfectants and antiseptics for the control of bacteria in infestations of utensils. 575,292. John Powell & Co., Inc.

Cinement. Film splicing cement. 575,712. Mansfield Industries, Inc.

RA:PID:GRO. Plant fertilizer, 577,811. RA-PID-GRO Corp.

HEXAMITE. Insecticides. 578,012. Food Machinery and Chemical Corp.

CRESTECO. Laundry sour. 578,017. Hood Chemical Co., Inc.

CRESTOCIDE. Laundry sour. 578,018. Hood Chemical Co., Inc.

CRESTORON. Laundry sour. 578,019. Hood Chemical Co., Inc.

ZYZZLE. Soft water bleach. 578,279. Albert J. Onessimo.

PAN-THION. Insecticides and fungicides. 578,304. Woolfolk Chemical Works, Ltd.

CRISP. Liquid laundry starch. 578,413. Roselux Chemical Co., Inc.

International. Fertilizers. 578,505. International Minerals & Chemical Corp.

International. Double sulfate of potash and magnesia, and for muriate of potash, each used as a fertilizer ingredient. 578,978. International Minerals & Chemical Corp.

* **GLISS'N.** Soluble detergent in powder form for general household cleaning purposes. 493,346. Gliss'n Products Co., Inc.

Crocodile. Carbon papers, ink ribbons, and inks. 499,181. Per Wenander.

a Decto product. Furniture polish. 513,655. Decto Products Co.

Weedeath. Preparation for destroying obnoxious thistles or weeds. 515,500. Howard Hanson & Co.

ROACHMASTER. Liquid chemical composition for insecticide. 515,507. Michigan Chemical Corp.

DURAHEART. Prepared paints, enamels, varnishes, lacquers; paste, semi-paste, ready-mixed antifouling and marine paints. 516,893. Hart and Burns, Inc.

M-L. Flatting pigments for use in the paint industry. 516,898. Interchemical Corp.

ROSEMASTER. Chemical composition for use as a pesticide for ornamental shrubs and flowers. 518,161. Michigan Chemical Corp.

"SEAL FLEX". Asphalt and rubber composition construction joint material for filling cracks or openings in construction joints. 520,340. Lamb Rubber Corp.

STAFCO. Adhesives for pasting leather to glass, steel, or aluminum frames, as part of the leather tanning process, supplied in either dry powder or heavy paste form. 521,540. Stahl Finish Co.

* The following are from Official Gazette, Vol. 633, No. 4, and Vol. 634, Nos. 1 ,2, 3.

KEMART. Additive for inks and pigments to enhance their absorption of ultra-violet light, destroy fluorescence, and lower their actinic reflective properties. 522,088. Kemart Corp.

K. Additive for inks and pigments to enhance their absorption of ultra-violet light, destroy fluorescence, and lower their actinic reflective properties. 522,090. Kemart Corp.

KIL-ZAL. Insecticides. 522,471. National Labs.

TYRE-WYTE. Liquid latex coating composition for application to rubber surfaces—namely, tire walls. 524,832. R. M. Hollingshead Corp.

BLU-SHEEN. Liquid cleaning composition for use in cleaning rugs and other textile materials. 524,877. Blu-Sheen Rug and Upholstery Cleaning Co., Inc.

AUTOPLATE. Liquid protective coating wax for use on automobile bodies. 524,891. Wilbert Products Co., Inc.

AUTO-SHIELD. Liquid asphalt mixture to be hand painted or sprayed on the under parts and chassis of automobiles or other vehicles to prevent rust and other corrosion and to reduce vibration. 525,163. Allied Materials Corp.

PEEL-IT. Masking coating adapted to be removed or peeled off after serving a temporary purpose. 525,164. Harco Chemical Co.

ACP. Metal-containing plating material. 529,332. American Chemical Paint Co.

ENS-ZEM. Insecticides. 532,364. Stauffer Chemical Co.

SWAYDEX. Lacquers, paint enamels, and varnishes. 537,914. Maas & Waldstein Co.

BRITELUME. Air drying and baking paint enamels giving an aluminum-like finish. 537,924. Maas & Waldstein Co.

ALL STAR. Varnish. 538,357. Chicago Paints, Inc.

FIRE BOY TRADEMARK. Fire extinguishing preparation composed of bicarbonate of soda, silica, chalk, and dye coloring. 538,708. Charles Harbison Avery.

INGO. Chemical preservative containing composition for protecting wood, metal, stone, or composition board and paper, against weathering or insects. 542,315. Horace E. Heindel Co.

Fuller. Bath salts, hand lotion, moth crystals, chemical moth repellant in block form, pine oil disinfectant, shampoo, tooth paste, tooth powder. 543,436. Fuller Brush Co.

CEM-GARD. Paints for exterior use concrete, stucco, and brick. 546,673. Detroit Graphite Co.

PLASOLUX. Alkyd resinous synthetic paints and paint enamels. 547,315. Walter N. Boysen Co.

PAINT RESEARCH ASSOCIATES, INC. PRA. Ready-mixed paints for exterior use on wood, metal, and concrete structures; interior paints, enamels, varnishes, and wood stains. 547,653. Paint Research Associates, Inc.

"IT STAYS ON". Ready mixed exterior and interior paints, paint enamels, paint primers and varnish. 547,855. Jay-Kay Paint Mfg. Co.

TEOFLUX. Paints, paint enamels, ready-mixed interior and exterior paints, roof paints, marine paints, house paints, synthetic paints, and liquid paints, lacquered paints, lacquers, and varnishes. 548,274. Naamlooze Vennootschap Vernis en Verfwaren fabriek V/H J. Wagemakers & Zonen.

PANALENE. Mixture of hydrocarbon liquid fractions for use in manufacture of plastics, elastomers, chemical intermediates, adhesives, solvents, insecticides, and wood preservatives. 548,683. Pan American Refining Corp.

PANASOL. Mixture of nonalcoholic organic liquid fractions derived from petroleum and used in the manufacture of plastics, elastomers, adhesives, rubber, paints, varnishes, lacquers, etc. 548,685. Pan American Refining Corp.

HAMMERFLEX. Ready mixed oil paints, paint primers, sealing compounds in the nature of liquid paint, paint and lacquer thinners, lacquers, varnishes, baking and paint enamels, etc. 549,233. Coating Materials Labs., Inc.

SPIRITTINE. Furniture polish, wood turpentine, and pine oil for use in deodorants and disinfectants. 552,888. Spirittine Chemical Co.

KEMWOOD SEAL. Varnish and compositions in the nature of paint, varnish, shellac, or sealers for sealing and finishing wood surfaces. 553,137. Sherwin-Williams Co.

PAGE BELTING CO. Cement and waterproof cement for use with leather belts and analogous items. 553,394. Page Belting Co.

Duncan Phyfe. Varnish. 553,435. Valentine & Co., Inc.

Antiquax. Polishing wax. 554,402. Frank Partridge, Inc.

Brunswick. Lacquer, bowling alley lacquer, lacquer thinner, paint enamel, shellac, shellac thinner, bowling alley base coat in the nature of a lacquer, bowling alley conditioner in the nature of an oil coating composition, bowling alley approach finish in the nature of a lacquer, bowling alley finish thinner in the nature of a solvent. 556,555. Brunswick-Balke-Collender Co.

(Symbol) Billiard ball polish in the nature of a wax and billiard ball cleaner in the nature of an abrasive composition. 558,277. Brunswick-Balke-Collender Co.

FLUOROGRAY. Artists' paints for retouching outlining photographic and other copy for reproduction. 559,714. Kemart Corp.

You Don't Have to Adjust Your Formula With Each Shipment of Stearic Acid...

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HYSTRENE* stearic acids bring to the chemical industry an entirely new concept of commercial stearic acid purity and uniformity—in *specific* grades ranging from 70% to 97% in true stearic acid content. Now, in making cosmetics, or in esterifying, the manufacturer can count on getting the same results *every* time with any of the HYSTRENE grades. HYSTRENE *puts an end to the practice of changing formulas because of stearic acid variations from shipment to shipment.*

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• CHEMICAL INDUSTRIES presents here a catalog of new chemicals and chemical specialties introduced by its advertisers since October, 1949. Chemicals and specialties are grouped separately in alphabetical order. These products will be displayed in CHEMICAL INDUSTRIES' exhibit at the 6th National Chemical Exposition, Chicago Coliseum, Chicago, Sept. 5-9.

ALKYL PHENOL C-9

M. W., 215; Sp. G., 0.950 @ 20°/4°C.; Hydroxyl No., 253; R.I., 1.513 @ 20°C.; distillation range (Mod. ASTM, 5-95%), 293-297°C.; flash pt. (TOC), 300°F.; a mixture of monoalkyl phenols, predom. para substituted; insol. water and dilute caustic; sol. benzene, chlorinated solvents, aniline, heptane, aliphatic alcohols and ethylene glycol. Chemical properties: Can be reacted with epoxides or chlorohydrins, nitrated, halogenated, mercurated, hydrogenated, acylated and sulfonated or sulfurized. Suggested uses: In synthesis of non-ionic detergents, lubricating oil additives, plasticizers and rubber chemicals; as a stabilizer for ethyl cellulose, as an antioxidant and as a plasticizer for cellulose esters. Availability: Pilot-plant quantities. Jefferson Chemical Co., Inc.

ALUMINUM CHLORATE

A colorless water solution containing Al. and Chlorate ions. Sp. G., 30°B.; faintly acid to litmus. Used for astringent and antiseptic purposes. Amend Drug & Chem. Co.

ALUMINUM STEARATE D-51 (Tech.)

Fine, grainy, white or slightly yellow-white powder; odorless or having only a slight odor of fatty acid. Aluminum oxide: 9%-10.5%; 90% through 80-mesh sieve; bulk: 45-60 fl. oz./lb. Differs from older types of aluminum stearate in that 30-60% less D-51 is needed to make greases of equivalent gel strength. Suggested use: An extremely high efficiency gelling agent used to produce lubricating greases. Availability: Commercial quantities. Mallinckrodt Chemical Works.

ALUMINUM STEARATE 30-13

Fine, white or nearly white powder; odorless or having only a slight odor of fatty acid. A mild gelling agent. An aluminum stearate with low arsenic (5 ppm) and heavy metals (50 ppm) content; aluminum oxide, 7.5-9.5%; 90% through 80 mesh sieve; bulk, about 55 fl.oz./lb. Suggested uses: Cosmetics, pharmaceuticals, lubricating greases which must be free of toxic materials. Availability: Commercial quantities. Mallinckrodt Chemical Works.

ALUMINUM STEARATE SPECIAL M (Monostearate)

Fine, white to yellow-white, grainy powder; odorless or having only a slight odor of fatty acid. A mild gelling agent. An aluminum stearate with low arsenic (5 ppm) and heavy metals (50 ppm) content; aluminum oxide, 14.5-16%; 90% through 80 mesh sieve; bulk, 55-65 fl.oz./lb. Suggested use: To suspend procaine-penicillin in vegetable oils. Availability: Commercial quantities. Mallinckrodt Chemical Works.

3-AMINO-4-CHLOROBENZOTRIFLUORIDE

$C_6H_3CF_3NH_2Cl$. M.W., 195.58; Sp. G., 1.4198 @ 25°C./25°C.; R.I., 1.4978 @ 20°C.; B.P., 201-203.5°C. (± 760 mm. Hg). Appearance: Reddish, clear, water-insol. oil having a characteristic aniline odor. Chemical reactions: Undergoes reactions similar to those of the amino chlor benzenes. The trifluoromethyl group is quite stable to usual methods of hydrolysis and is strongly meta directing. Possible uses: As an intermediate for the preparation of various dyestuffs and pharmaceuticals. Availability: Laboratory quantities. Hooker Electrochemical Co.

bis-(3-AMINO-4-HYDROXYPHENYL)-SULFONE

$(HONH_2C_6H_3)_2SO_2$. M.W., 280.1; brown powder; M.P., 220-223°C. Suggested use: As a dyestuff intermediate and as an intermediate for synthesis. Availability: Research quantities. Monsanto Chemical Co., Merrimac Div.

p-AMINOSALICYLIC ACID

2-Hydroxy-4-aminobenzoic acid, C_6H_3 (COOH)-(OH)(NH_2). M. range (under rigidly controlled conditions 147°-150°C.; M. W. 153.13. Occurs as a white to yellowish-white crystalline powder; darkens on exposure to light and air, and therefore should be kept in well-closed, light resistant containers. Sl. sol. in water and readily sol. in solutions of alkali hydroxides, carbonates, or bicarbonates. Uses: Alone and in conjunction with streptomycin in the treatment of tuberculosis. Commercially available. Calco Chemical Division, American Cyanamid Co.

2-AMINO-5-NITROTHIAZOLE

$C_3HN_3S(NO_2)(NH_2)$. M. range 195°-200°C.; M.W. 145.14. Occurs as a coarse dark-green powder or lumps, with characteristic odor. Use: The first practical, economical, and effective drug for the prevention and control of blackhead disease in turkeys. Fed continuously for prevention, or in larger concentrations for control of outbreaks. Commercially available. Calco Chemical Division, American Cyanamid Co.

p-AMINOSALICYLATE SODIUM

Dihydrated sodium salt of *p*-aminosalicylic acid. M. W. 211.15. Occurs as a white to yellowish-white crystalline powder; darkens on exposure to light and air, and therefore should be kept in well closed, light-resistant containers. Sol. in water, insol. in alcohol. Uses: As a water-soluble form of *p*-aminosalicylic acid (*which see*) in the therapy of tuberculosis. Commercially available. Calco Chemical Division, American Cyanamid Co.

AMMONIUM SUCCINATE

$(CH_2COONH_4)_2$. M.W., 152.15; white crystals; sol. in water and alcohol. Suggested use: Pharmaceutical. Availability: Semi commercial. City Chemical Corp.

ANTIOXIDANT 2246

2, 2'-Methylene-bis(4-methyl-6-tert-butylphenol) $C_{23}H_{32}O_2$. M. W., 340; Sp. G., ca. 1.04; M.P., 120-130°C.; very stable; odor, slightly phenolic; toxicity, appears to be non-toxic. 0.5 to 1.5% Antioxidant 2246 has little or no effect on the scorching tendency or cure of rubber stocks. Discoloration: None to slight. Minimum discoloration on exposure to sunlight and maximum protection against oxidation during aging of rubber. Calco Chemical Division, American Cyanamid Co.

BARIUM BENZOATE

$Ba(C_7H_5O_2)_2 \cdot 2H_2O$. M.W., 469.57; white crystals; sol. in 20 parts of water; slightly sol. in alcohol. Availability: Laboratory scale. City Chemical Corp.

BARIUM HYPOPHOSPHITE

$Ba(H_2PO_2)_2H_2O$. M.W., 285.45; white crystals; Sp. G., 2.90; sol. in water; insol. in alcohol. Availability: Laboratory scale. City Chemical Corp.

BENZENESULFONYL FLUORIDE

$C_6H_5SO_2F$. M.W., 160; Sp. G., 1.329 @ 20°C.; R.I., 1.439 (Nd20); B.P., 209°C. (760 mm); Surf. Tens., 40.7 dyne/cm. (28°C.); sol. in water, 0.01% @ 20°C.; odor, pungent, aromatic; color, water white; thermally stable. Availability: Small quantities for exptl. investigation. The Pennsylvania Salt Mfg. Co.

BENZYL β-METHYL UMBELLIFERONE (EdBrite 200)

7 Hydroxy 4 methyl 3 benzyl coumarin; $C_{17}H_{14}O_3$. M.W., 266.28; M.P., 230-232°C.; crystalline solid; color, very light yellow; solubilities (25°C.): H_2O, 0.015%; EtOH, 1.3%; acetone, 2.0%; benzene, 0.04%. Fluorescent band from 392-490 millimicrons, max. at 448. Relatively non-toxic. Suggested uses: Emits blue light when irradiated by sun or UV, neutralizes yellow tints; use in soaps, textiles, plastics, etc.; intermediate in organic synthesis. Availability: Commercial quantities. Edwal Labs., Inc.

BETAINE HYDRATE

$C_5H_{11}ON \cdot H_2O$. M.W., 135.11; colorless crystals of sweet taste; sol. in water and alcohol; 10.4% N. Suggested use: In nutritional studies involving diseases of the liver. Availability: Commercial quantities. Chemo Puro Mfg. Corp.

BISMUTH DIETHYL ACETATE

$Bi(C_2H_5HCO_2)_3$. Bismuth salt of 2 ethyl-butyric acid. White powder; faint fatty odor; insol. in water; sol. in acids. Used to combine soothing effect of bismuth with fungicidal action of 2-ethyl-butyric acid. Amend Drug & Chem. Co.

BISMUTH LACTATE

$BiOH(C_3H_5O_3)_2 \cdot 7H_2O$. White powder decomposed by water. Used to replace bismuth subnitrate. Amend Drug & Chem. Co.

BISMUTH TANNATE

Approx. $Bi(C_{14}H_{10}O_9)_3$. Brownish-yellow powder; insol. in water. Used as intestinal astringent. Amend Drug & Chem. Co.

BISMUTH TARTRATE

$Bi(C_4H_4O_6) \cdot 6H_2O$. White powder; insol. in water; sol. in alkali hydroxide solutions or in acids. Intermediate in preparation of soluble bismuth salts for medicinal use. Amend Drug & Chem. Co.

m-BROMOBENZOTRIFLUORIDE

$CF_3C_6H_4Br$. M. W., 224.95; Sp. G., 1.621 @ 25°C./4°C.; R.I., 1.4770 @ 20°C.; B.P., 153-155°C. (760 mm.). Chemical properties: Undergoes Grignard reactions and further ring substitution. The trifluoromethyl group is quite stable to usual methods of hydrolysis. Suggested uses: Intermediate for dyes, pharmaceuticals and organic compounds in general. Availability: Laboratory quantities. Hooker Electrochemical Co.

1-BROMO-3-CHLOROBUTANE

$CH_3CHClCH_2CH_2Br$. M. W., 171.5; B. P., 92-95°C. @ 100 mm.; insol. in water; odor, sweet; color, waterwhite Suggested uses: In the synthesis of pharmaceuticals and other organic chemicals and in the preparation of synthetic fibers. Availability: Research quantities. Halogen Chemicals, Inc.

p-tert-BUTYL BENZOIC ACID

M. P., 163°C. (min.); oil-sol., monobasic acid, readily esterified. Recommended for the modification of alkyd resins to improve gloss, hardness, color and leveling. The presence of the alkyl substituent imparts greater solubility and wider resin compatibility. Better light stability and color retention may be obtained in air-dry, baking and non-drying alkyds by the partial replacement of the fatty acids with this 99% pure intermediate. Shell Chemical Corp.

2-tert-BUTYL-p-CRESOL

$(CH_3)_3C{\bullet}C_6H_3{\bullet}OH(CH_3)$. M.W., 164.24; M.P., 51.0°C.; B.P., 149°C. @ 50 mm.; light-colored; crystalline solid; phenolic odor. A nuclear mono-reactive alkyl phenol. Typical reactions include: Etherification, sulfurization, hydrogenation, esterification, halogenation, sulfonation, nitration, vinylation, carboxylation, and aldehyde condensation. Suggested uses: In the synthesis of alkyl phenol-formaldehyde condensation products and other organic chemicals. Availability: Commercial quantities. Koppers Co., Inc., Chemical Div.

t-BUTYL PERACETATE

$CH_3CO(O_2)C(CH_3)_3$. M.W., 132.15; purity, 90.0% minimum; active oxygen, 11.5% min.; flash pt. (Cleveland Open Cup), above 100°F.; clear, water-white liquid; Sp.G., 0.94 @ 25°/4°C.; sol. in common organic solvents; slightly sol. in water. Uses: Pharmaceutical and fumigant applications requiring a somewhat volatile, but otherwise stable, liquid type perester; as a polymerization catalyst, and could be considered as being moderately reactive when used with commercial vinyl monomers at temperatures above 130°C. Availability: Commercial quantities. Lucidol Div., Novadel-Agene Corp.

t-BUTYL PERCAPRYLATE

$CH_3(CH_2)_6CO(O_2)C(CH_3)_3$. M.W., 216.3; purity, 95.0% min.; active oxygen, 7.0% min.; flash pt. (Cleveland Open Cup), above 100°F.; a clear, water-white liquid; Sp. G., 0.8979 @ 25°C.; sol. in common organic solvents, insol. in water. Uses: In bleaching or pharmaceutical applications requiring a stable, neutral, liquid type perester; as a polymerization catalyst for vinyl monomers, and should be considered for applications at temp. above 100°C. Availability: Pilot plant quantities. Lucidol Div., Novadel-Agene Corp.

CADMIUM CHLORIDE A.R. (Anhydrous)

$CdCl_2$. M.W. 183.32. White powder; odorless. Sol. in water. Differs from previous commercially available grades in that the lead content is in the range of 2 ppm and the copper content is in the range of 1 ppm. Suggested use: As a starting material for the preparation of cadmium sulfide for television phosphors. Availability: Commercial quantities. Mallinckrodt Chemical Works.

CADMIUM STERATE C. P.

$C_{36}H_{70}O_4N_4.HI.I_2{\cdot}1\frac{1}{2}H_2O$. Almost black, micro-M. Pt., 113-117°; insol. in water, sol. in hot alcohol; resistant to wetting by water. Suggested uses: Mold lubricant, resin formulation. Availability: Laboratory scale. City Chemical Corp.

CADMIUM SULFATE A.R. (Granular)

$3CdSO_4 \cdot 8H_2O$. M.W. 769.56. Fine, white or colorless, crystalline granules; odorless; sol. in water. Differs from previous commercially available grades in that the lead content is in the range of 1 ppm. Suggested use: As a starting material for the preparation of cadmium sulfide for television phosphors. Availability: Commercial quantities. Mallinckrodt Chemical Works.

CAFFEIN-TRI-IODIDE

$C_8H_{10}O_2N_4.HI.I_2{\bullet}1\frac{1}{2}H_2O$. Almost black, microcrystalline powder; M.P., 171°; insol. in water; sol. in alcohol. Used for systemic administration of iodine. Also for sterilization of drinking water. Amend Drug & Chem. Co.

CALCIUM DIETHYL ACETATE

$Ca(C_6H_{10}CO_2)_2$. Granular white particles; faint fatty odor; slightly sol. in water. Used for fungicidal effect. Amend Drug & Chem. Co.

CALCIUM IODATE

$Ca(IO_3)_2$. White microcrystalline material; slightly sol. in water; sol. in nitric acid. Used as reagent. Amend Drug & Chem. Co.

CALCIUM NITRITE

$Ca(NO_2)_2$. White crystals; hydroscopic; very sol. in water; decomposed by acids. Used as a reagent. Amend Drug & Chem. Co.

CALCIUM PYRUVATE

$Ca(C_3H_3O_3)_2$. White crystalline powder. Difficultly soluble in water. Used as reagent. Amend Drug & Chem. Co.

CARBAZINIC ACID

$CH_4O_2N_2$. A white powder which decomposes at 85°C. Suggested uses: Reducing agent and a convenient source when dissolved in water of hydrazine for synthesis purposes. Available in semi-commercial quantities. Mathieson Chemical Corp.

CERIUM (OUS) MOLYBDATE

$Ce_2(MoO_4)_3$. M.W., 760.1; yellow crystalline powder. Sp. G., 5.03; insol. in water. Availability: Laboratory scale. City Chemical Corp.

CERIUM (OUS) TUNGSTATE

$Ce_2(WO_4)_3$. M.W., 1024.0; tan powder. Sp. G., 6.77. Insol in water Availability: Laboratory scale. City Chemical Corp.

CETYL DIMETHYL ETHYL AMMONIUM BROMIDE

Tech. grade. Approx. 75% active in isopropyl alcohol. A white paste. Availability: Semi-commercial. Onyx Oil & Chemical Co.

CHLORCACETALDEHYDE

40% water sol'n.; colorless; Sp. G., 1.203 @ 25/25°C.; R.I., 1.3998 @ 25°C.; moderately toxic orally; irritating to skin; strong sol'ns corrosive. Very strong aldehyde undergoing all typical reactions; also has replaceable Cl-atom (must block aldehyde group). Available in lab. quantity. The Dow Chem. Co.

2-CHLORO-5-AMINOBENZOTRIFLOURIDE

$C_6H_3CF_3ClNH_2$. M.W., 195.58. Chemical properties: L.C.P., 36-37°C. Appearance: Reddish, crystalline solid with a characteristic aniline odor. Possible uses: As an intermediate for the preparation of various dyestuffs and pharmaceuticals. Availability: Laboratory quantities. Hooker Electrochemical Co.

p-CHLOROBENZENESULFONYL FLUORIDE

$ClC_6H_4SO_2F$. M.W., 195; Sp. G., 1.475 @ 55°C.; R.I., 1.506 @ 55°C.; M.P., 46-51°C.; B.P., 229-230°C.; % hydrolysis, water, 2.8 (1 hr. @ 100°C.); thermally stable; less inert than corresponding chlorides. Availability: Small quantities for exptl. investigation. The Pennsylvania Salt Mfg. Co.

bis (CHLOROMETHYL ETHER)

$ClCH_2{\cdot}O{\cdot}CH_2Cl$. M.W., 114.97; Sp. G., 1.338-1.342 @ 20°/15.5°C.; chlorine content, 56-60%; purity, 90-95%; color, water white to light lavender; odor, sharp, pungent. Suggested uses: General chloromethylations, quaternary ammonium compounds. The two chlorine atoms are extremely active. Availability: Small quantities for experimental purposes. Hooker Electrochemical Co.

4-CHLORO-2-METHYLPHENOXYACETIC ACID

$CH_3ClC_6H_3CH_2COOH$. M.W., 200.3; M.P., 110°-115°C.; tan powder; sol. in alcohol, benzene and acetone; sparingly sol. in water. Suggested use: As selective herbicide. Availability: Pilot-plant quantities. Monsanto Chemical Co., Organic Div.

CHOLINE BITARTATE

$C_9H_{19}O_7N$. M.W., 253; white, non-hygroscopic granules of acidic taste; very sol. in water and alcohol; 48% choline. Suggested use: In lipotropic formulations, to replace choline dihydrogen citrate because of higher choline contents and greater ease of handling. Availability: Commercial quantities. Chemo Puro Mfg. Corp.

CHROMIUM (ic) BORATE

$Cr(BO_2)_3$. Green powder; insol. in water. Used as pigment, especially in ceramics. Amend Drug & Chem. Co.

COBALT GLUCONATE

$(C_6H_{11}O_7)_2Co$. M.W., 449; pink, odorless powder; very sol. in water; insol. in alcohol; 13% Co. Suggested uses: In vitamin and mineral drug preparations, to catalyze the absorption of iron and promote hemoglobin formation. Availability: Commercial quantities. Chemo Puro Mfg. Corp.

COBALT SILICATE (META)

$CoSIO_3$. M.W., 135.0; rose-red powder; insol. in water; decomposed by mineral acids. Suggested use: Pigment (ceramics). Availability: Laboratory scale. City Chemical Corp.

COBALT SILICATE (ortho)

Co_2SiO_4. M.W., 209.94; rose-red powder; insol. in water; sol. in dil HCl. Suggested use: Pigment (ceramics). Availability: Laboratory scale. City Chemical Corp.

COPPER BENZOATE

$Cu(C_7H_5O_2)_2{\cdot}2H_2O$. M.W., 341.7; light blue, crystalline powder; slightly sol. in water; decomposed by dilute acids to give benzoic acid crystals. Availability: Semi commercial scale. City Chemical Corp.

COPPER BENZOATE, (Anhydrous)

$Cu(C_7H_5O_2)_2$. M.W., 305.7; glistening blue crystals; slightly sol. in water; decomposed by dilute acids to give benzoic acid crystals. Availability: Semi commercial scale. City Chemical Corp.

COPPER COBALTICYANIDE

$Cu{\bullet}Co(CN)_6$. M.W., 620.6; pale blue powder; insol. in water; sol. in ammonium hydroxide. Availability: Laboratory scale. City Chemical Corp.

COPPER SULFATE, CPA (Anhyd.)

$CuSO_4$. M.W., 159.63; white or greyish white, hygroscopic powder; sol. in water. Suggested uses: Catalyst desiccant. Availability: Semi commercial scale. City Chemical Corp.

m-CRESYL ACETATE

$C_9H_{10}O_2$. M.W., 150.17; colorless oily liquid; characteristic odor; practically insol. in water; sol. in ordinary organic solvents and in fixed and volatile oils; volatile with steam. Technical and NNR grades. Use: Medicinal. Availability: Semi commercial scale. City Chemical Corp.

CUPROUS CHLORIDE (Battery Grade)

Cu_2Cl_2. M.W., 197.99; fine, white to pale green powder; odorless; if exposed to moist air, this salt oxidizes and acquires a green color; almost insol. in water; sol. in HCl or NH_4OH. Characterized by high assay of approximately 97%. Suggested use: Manufacture of batteries. Availability: Commercial quantities. Mallinckrodt Chemical Works.

CYANOACETIC ACID

$CNCH_2COOH$. M.W., 85.06; purity, 98.0% min.; M.P., 61.1-66.9°C.; corr. B.P., 108°C. @ 0.15 mm.; infinitely sol. in water; slightly sol. in benzene; sol., alcohol; white deliquescent crystals. Chemical properties: Contains a highly reactive "Cyanoactivated" methylene group which is particularly useful in condensations. The Cyano group may be hydrolyzed relatively easily. Suggested uses: In the synthesis of the purine group, certain poly-methine dyes, special resins, barbiturates, pantothenic acid, cyanoacetyl urea and other photographic chemicals and coloring agents, malonic acid der., certain pyrazolones, cyanoacetyl chloride, etc. Availability: Commercial quantities. American-British Chemical Supplies, Inc., Kay-Fries Chemicals, Inc.

DIAMYL PHENOL SULFIDE

(Santowhite L) $(C_5H_{11}C_6H_4OH)_2S$. M.W., 360; dark viscous syrup; phenolic odor; softening pt., 0°C.; Sp. G. 0.99 @ 25°C. Sol. in benzene, toluene, acetone, diethyl ether; insol. in water but easily emulsifyible. Suggested use: As a non-discoloring antioxidant for foamed latex sponge and other rubber stocks. Availability: Commercial quantities. Monsanto Chemical Co., Rubber Service Dept., Organic Div.

facts you should know about

SODIUM DISPERSIONS

SODIUM DISPERSIONS

These are stable dispersions of metallic *sodium* in inert media which boil at a temperature above the melting point of *sodium*. They contain up to 50% (by weight) of *sodium* and are easily handled in pipes at room temperature.

PARTICLE SIZE

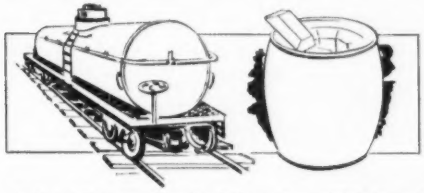
Size of *sodium* particles in these concentrated dispersions varies with the method of preparation. Particle sizes ranging from submicron to 20 microns can be obtained easily.

ADVANTAGES

The fine subdivision of *sodium* tremendously increases the surface area of the metal available for reaction. The resulting increased reactivity now opens up a new field of *sodium* chemistry. Reaction rates are stepped up while temperatures can be lowered with corresponding increases in yields. Side reactions also are reduced.

MANUFACTURE

Sodium dispersions are made in a commercially-available colloid mill. The process is simple and can be carried out in your own plant for either pilot or full-scale operation. Our technical staff has developed typical equipment diagrams and layouts covering the entire range of production requirements.



National Distillers Metallic Sodium *is available in tank cars, 80,000 lbs., net; or in open-head 55-gal. steel bbls., 290 lbs., net, containing 1, 2½, 5 or 12½ lb. bricks.*

SODIUM DISPERSION USES

Sodium dispersions offer advantages in the following applications: Claisen condensation reactions; in desulfurizing and purifying hydrocarbons; in preparing *sodium* alcoholates; in Wurtz reactions; in the preparation of anhydrous cellulose ethers; in the preparation of finely-divided metals. Many other reactions may be visualized where increased reactivity and control are critical factors.

SAMPLES

Samples of *sodium* dispersions are available in research quantities. Dispersions in inert media such as toluene, xylene, naphtha, kerosene, white oil, Nujol, petroleum jelly, naphthalene or paraffin can be supplied on request.

TECHNICAL ASSISTANCE

The Research Division of National Distillers Chemical Corporation can help you on any problem involving the preparation, use and handling of *sodium* dispersions, or on the use and handling of metallic *sodium*. On request, we shall be pleased to have a technical representative call upon you. Please address your inquiries to National Distillers Chemical Corporation, 120 Broadway, New York 5, N. Y.

NATIONAL DISTILLERS CHEMICAL CORPORATION

National Distillers
CHEMICAL CORPORATION

DIBROMODIFLUOROMETHANE

CBr_2F_2. M.W., 120.9; B.P., 22.75°C. (760 mm Hg); M.P., —141.0°C.; Sp. G., 2.2884 @ 15/4°C.; R.I., 15/D, 1.3999; vap. density, 9.476 g./l. (0°C at 760 mm); no explosion in pure O_2 from 6.6-20.2%. Available in pilot plant quant. The Dow Chem. Co.

2,5-DIBROMOHEXENE

$CH_2CHBr(CH_2)_2CHBrCH_3$. M.W., 244.0; B.P., 98-100°C. @ 20 mm.; insol. in water; odor, sweet; color, water-white to amber. Suggested uses: In the synthesis of pharmaceuticals and other organic chemicals and in the preparation of synthetic fibers. Availability: Research quantities. Halogen Chemicals, Inc.

DIBUTYL FUMARATE

$C_4H_9OCOCH{:}CHCOOC_4H_9$. M.W., 228.28; Sp. G., 0.9873 @ 20/20°C.; B.P., 285.1°C. @ 760 mm.; Vap. P., <0.01 mm. Hg @ 20°C.; M. P., —15.6°C.; sol. in water, <0.1% by wt. at 20°C., sol. water in, 0.38% by wt. @ 20°C.; viscosity @ 20°C., 5.5 cps.; R.I., 1.4466 @ 20°C. Chemcal properties: Adds halogens and other active materials to double bond in usual fashion, does not polymerize readily but copolymerizes with vinyl monomers in presence of peroxide catalysts. Uses: Copolymerization with vinyl chloride, resin modification. Available in pilot-plant quantities. Carbide and Carbon Chemicals Div.

DI-n-BUTYL ISOPROPANOLAMINE

$CH_3CHOHCH_2N(C_4H_9)_2$. M.W., 187.32; Sp. G., 0.8419 @ 20/20°C.; B.P., 228.9°C. @ 760 mm.; Vap. P., <0.1 mm. Hg @ 20°C.; M. P., sets to a glass below —80°C.; sol. in water, 0.10% by wt. @ 20°C.; sol. water in, 2.0% by wt. @ 20°C.; viscosity, 3.5 cps. @ 20°C.; R.I., 1.4361 @ 20°C.; flash pt. (Cleveland Open Cup), 205°F. A new tert. amine which also contains a sec. alcohol radical. Available in pilot-plant quantities. Carbide and Carbon Chemicals Div.

N,N-DICARBOXYETHYL BENZENESULFONAMIDE

$C_6H_5SO_2N(CH_2CH_2COOH)_2$. M.W., 301.3; white powder; assay 98-100%; M.P., 148-153°C.; sol. in water; 4.10 g./l. @ 30°C., 851 g./l. @ 90°C.; sol. in acetone and ethanol; insol. in toluene, ether, ethylene dichloride, kerosene. Chemical properties: As a dibasic acid it undergoes all reactions common to the carboxyl groups such as salt formation, esterification, amidation, etc. Suggested uses: In the synthesis of pharmaceuticals, non-volatile solvents, polyester and polyamide resins, plasticizers. Availability: Pilot-plant. Wyandotte Chemicals Corp.

DICHLOROACETIC ACID

$Cl_2CHCOOH$. A colorless liqd.; boiling range (5-95%), 191-194.7 °C. @ 760 mm Hg; R.I., 1.464 @ 25°C.; Sp. G., 1.562 @ 25/25°C.; M.P., 10°C.; no flash or fire pt.; inf. sol. in acetone, benzene, CCl_4, ether, methanol, water; color, (APHA), not greater than 20; assay, 99.0% min. Available commercially. The Dow Chem. Co.

m-DICHLOROBENZENE

$C_6H_4Cl_2$. M.W., 147.01; B.P., 173°C. @ 760 mm.; Sp. G., 1.288 20°/4°C.; sol. in methanol, acetone, acetic acid; insol. in H_2O and ethylene glycol; water white, mobile liquid; characteristic dichloro-benzene odor. Purity, essentially ortho free; contains some paraisomer. Suggested uses: As a dye or plastic intermediate in pharmaceuticals. Availability: Small quantities for experimental investigations. Hooker Electrochemical Co.

p-DICHLORBENZENESULFONIC ACID

$Cl_2C_6H_3SO_3H$. M.W., 227.07; white powder; sol. in water; 31% Cl. Suggested uses: Dyestuff intermediate. Availability: Commercial quantities. Chemo Puro Mfg. Corp.

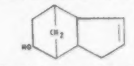
2,5-DICHLOROPHENYL ISOCYANATE

$Cl_2C_6H_3NCO$. M.W., 188; Sp. G., 1.407 @ 34°/25°C.; R.I., 1.6725 @ 30°C.; B.P., 97°-98°C. @ 6 mm.; L.C.P., +29°C.; color, white crystalline solid below 26°C. Chemical properties: Undergoes typical reactions of phenylisocyanate, such as the formation of substituted ureas, carbonyl chlorides, ureathanes, carbamates, etc. Suggested uses: In the manufacture of alkyl resins, textile finishing agents, herbicides, dyes and pharmaceuticals. Availability: Laboratory samples. Hooker Electrochemical Co.

N,N-DICYANOETHYL BENZENESULFONAMIDE

$C_6H_5SO_2N(CH_2CH_2CN)_2$. M.W., 263.0; white solid powder; assay 95-98%; M.P., 89-92°C.; sol. in acetone, warm alcohol, ethylene dichloride; insol. in water, ether, kerosene, toluene. Chemical properties: The nitrile groups may be converted to carboxyl groups by hydrolysis or to ester groups by alcoholysis. The nitrile groups react with carboxyl groups to form amides. Suggested uses: In the synthesis of non-volatile solvents, pharmaceuticals, resins, plasticizers and other organic chemicals. Availability: Pilot plant. Wyandotte Chemicals Corp.

DICYCLOPENTENYL ALCOHOL



M.W., 150; B.P., 114-121°C.; Sp. G., 1.079 (25°/25°C.); Iodine No. 169; color, Varnish Scale, 5 max. Chemical properties: Undergoes normal reactions of sec. alcohols, such as esterification, oxidation to ketone, ether formation, etc. Double bond somewhat less reactive than an ordinary olefin, but can be readily hydrogenated to sat. alcohol. Suggested uses: Derivatives of the alcohol, particularly those containing at least 2 double bonds, can be polymerized to give tough, resistant coatings. Dicyclopentenyl linoleate is of interest as a thermosetting plasticizer for more unusual type vinyl coatings, such as those from diallyl maleate, and polyesters from glycols and maleic anhydride. The linoleate is compl. compat. with such materials and copolymerizes with them during drying, giving tough, glossy coatings with good adhesion. Availability: Exptl. and pilot-plant quantities. Rohm & Haas Co., Dept. SP.

DIETHOXY TETRAHYDROFURANE

$C_4H_9O(CH_2CH_2O)_2$. M.W., 160; B.P., 58.60°C. @ 10 mm.; Sp. G., 0.970 @ 20/20°C.; R.I., 1.4205 @ 20°C.; flash pt. (Cleveland Open Cup), 160°F. Chemical properties: Hydrolyzes readily in dil. mineral acids to yield succindialdehyde quantitatively. The aldehyde can in turn undergo all typical reactions such as condensation with amines and active methylene groups. Uses: Chemical and pharmaceutical syntheses involving succindialdehyde. Available in research quantities for exptl. use. Carbide and Carbon Chemicals Div.

DIETHYL ACETYLSUCCINATE

$CH_3COCH(CO_2C_2H_5)CH_2CO_2C_2H_5$. M.W., 216.2; colorless water-insol. oil; miscible with most organic solvents; B.P., 89-91°C. (0.5 mm.); R.I., 1.436 @ 25°C.; Sp. G., 1.078 @ 25°/25°C. Suggested use: As an intermediate for various syntheses. Availability: Experimental quantities. Monsanto Chemical Co., Merrimac Div.

N, N-DIETHYL ETHYLENE DIAMINE (Diethyl aminoethyl amine)

$(C_2H_5)_2NC_2H_4NH_2$. M.W., 116.15; Equiv. Wt., 58; Sp. G., 0.820 @ 20/20°C.; B.P., 60°C. @ 40 mm.; R.I., 1.4360 @ 20°C.; sol. in water in all proportions. Affords primary and tert. amino groups; can be used to prepare various cationic amides for use in textile finishing applications by reaction with fatty acids. Other cationic amides may be prepared for pharmaceutical applications by reaction with aromatic carboxylic compounds. Available in commercial quantities. Carbide and Chemicals Div.

DIETHYLENE GLYCOL DIBENZOATE

$(C_6H_5COOCH_2CH_2)_2O$. M.W., 314; Sp. G., 1.173 @ 25°C.; R.I., 1.543@26°C.; flash pt., 465°F.; fire pt., 490°F.; Kinematic visc. at 100°F. 29.64 centistokes; B.P., approx. 215° at 1½ mm.; sol. in water, <0.002% at 250°C.; miscible with organic solvents; odor, none; color, water-white. Chemical properties: Stable toward hydrolysis under normal conditions. NaOH at elevated temp. causes saponification. Suggested use: Plasticizers, paper coating, dielectrics. Availability: Pilot plant scale. Hooker Electrichemical Co.

DIETHYLENE GLYCOL bis (TRICHLOROACETATE)

$CCl_3COOCH_2CH_2OCH_2CH_2OCOCCl_3$. M. W., 397; B.P., 182°-190°C. @4 mm.; Sp. G., 1.536 @ 20/4°C.; water white, slightly oily liquid; pleasant fruity odor; non-corrosive to the skin. Suggested uses: Rubber vulcanization accelerator, weed killer formulations, plasticizer for PVC and cellulose acetate, pharmaceuticals, dye intermediate. Availability: Semi-commercial quantities. Hooker Electrochemical Co.

DI(2-ETHYLHEXYL) ADIPATE ("Flexol"® Plasticizer A-26)

$C_4H_{12}OCO(CH_2)_4COOC_8H_{17}$. M.W., 370; Sp. G., 0.9268 @ 20/20°C.; B.P., 214°. @ 5 mm.; Vap. P., 0.1 mm Hg @ 150°C.; viscosity, 13.7 cps. @ 20°C.; pour pt.; —60°C.; R.I., 1.4466 @ 20°C.; coeff. of expans., 0.00081 per °C. @ 20°C.; insol. in water @ 20° C.; sol. water in, 0.19% by wt. @ 20°C.; flash pt. (Cleveland Open Cup), 377°F.; compat. with vinyl chloride polymers and copolymers, nitrocellulose, polystyrene, polyvinyl acetate, chlorinated rubber, and cellulose acetate-butyrate; resistant to UV light, heat and water extraction; high D.C. resistivity; low power factor. Uses: Low temp. plasticizer with outstanding stability and elecrical properties. Available in commercial quantities. Carbide and Carbon Chemicals Div.

*Trade Mark

DI(2-ETHYLHEXYL) SUCCINATE

$C_8H_{17}OCOCH_2CH_2COOC_8H_{17}$. M.W., 342; Boiling Range, 150-170°C. @ 1 mm.; Sp. G., 0.931 @ 20/20°C.; power factor, 0.42%; D.C. resistivity, 4.64 x 10^9 megohms/cm.; color, 10 Pt-Co. Chemical properties: Hydrolyzes slowly in water. Uses: Plasticizer for cellulose esters or vinyl resins. Available in pilot-plant quantities. Carbide and Carbon Chemicals Div.

DIETHYLTHIOCARBAMYL CHLORIDE

$(C_2H_5)_2NCSCl$. M.W., 151.66; physical state, yellow solid; melting range, 48.8-50.6°C.; sol. in ethyl ether, acetone, benzene, hexane and ethyl acetate; reacts with many compounds, for example, methanol and water, urethan, thioureas, thiuram monosulfides and dithiocarbamates. Suggested use: As an intermediate for organic synthesis. Availability: Laboratory quantities. Sharples Chemicals, Inc.

DIHYDRAZINE OXALATE

$(N_2H_4)_2H_2C_2O_4$. A white free-flowing product. M.P., 140°C., but begins to decompose steadily at 130°C.; very sol. in water and practically insol. in most organic solvents. Suggested uses: Rubber accelerator, blowing agent, synthesis of hydrazine derivatives. Available in semi-commercial quantities. Mathieson Chemical Corp.

DIHDRAZINE PHOSPHATE

$H_{11}O_4N_4P$. A white free-flowing powder. M.P., 145°C.; decomposes at 168°C.; very sol. in ethyl alcohol, benzene and carbon tetrachloride. Suggested uses: Boiler water treatment, metal treatment and reducing agent. Available in experimental quantities. Mathieson Chemical Corp.

2,5-DIHYDROXY-1,4-BENZOQUINONE

$C_6H_4O_4$. M.W., 140.09; M.P., 214-216°C.; yellow-orange to brown solid; sparingly sol. in polar and non-polar cpds.; water-sol. salts can be formed; considered as stabilized enol form of a 1,2 diketone; vinylog of a dibasic acid. Forms colored complexes with variety of cations; also salts. Suggested uses: Polymerization inhibitor, metal deactivator, antioxidant, pharmaceutical, etc. Edwal Labs., Inc.

DIISOBUTENYL SUCCINIC ANHYDRIDE

$C_4H_{12}CHC(O)OC(O)CH_2$. M.W., 210.3; B.P., about 120°-130°C. at 1 mm.; Sp. G., 1.04 @ 25°/25°C.; colorless to pale yellow, viscous liquid; sol. in benzene; reacts with alcohol to form esters; insol. in water and decomposes slowly to the acid. Suggested use: As intermediate in alkyd resins, surface active agents, plasticizers and other fields. Availability: Pilot-plant quantities. Monsanto Chemical Co., Organic Div.

DIISOBUTYLAMINE

$[(CH_3)_2CHCH_2]_2NH$. M.W., 129.3; Sp. G., 0.74-0.75 @ 20°/20°C.; physical state, water-white liquid; Diisobutylamine content, 98% (min.); B.P., 95% between 134-141°C.; viscosity @ 60°C., 0.44 cps.; insol. in water; sol. in most organic solvents. Uses: Intermediate for pharmaceuticals, dyes, oil additives, textile chemicals and rubber chemicals. Availability: Commercial quantities. Sharples Chemicals, Inc.

p,p'-DI-ISOCYANATODIPHENYLMETHANE

p,p'$OCNC_6H_4CH_2C_6H_4NCO$. M.W., 250; pale yellow solid; water insol.; benzene sol.; M.P., about 37°C.; B.P., 194-199°C. (5 mm.); Sp. G., 1.185 @ 50°C. Suggested use: As a cross-linking agent for polymers, ingredient in foamed resins and in adhesives, and in the preparation of copolymers. Availability: Semi-commercial quantities. Monsanto Chemical Co., Phosphate Div.

O-DIMETHYL BENZYL CHLORIDE

$(CH_3)_2C_6H_5CH_2Cl$. M.W., 154.66; Sp. G., 1.060 @ 25°/4°C.; R.I., 1.5389 @ 25°C.; B.P., 90% @ 107-108°C. (15 mm.); V.P., @ 50°C., 0.4 mm. Hg.; V.P., @ 100°C., 10 mm. Hg.; chlorine, 22.7%; insol. in H_2O; comp. miscible with gasoline, benzene, EtOH and isopropyl ether; M.P., about —14°C.; visc., 2.6 cps. @ 20°C.; surf. tens., 30.0 dynes/cm. @ 20°C.; odor, penetrating and pungent, lachrymatory; color, water-white to pale yellow; 2,3 and 3,4 isomers with the latter predominating. Chemical properties: Undergoes reactions typical of benzyl chloride. Ease of replcmt. of Cl-atom is greater than for benzyl chloride. The chloromethyl group can be further halogenated, oxidized and reduced. The aromatic nucleus can be sulfonated, nitrated, halogenated, etc., with due regard for the activity of the substituent groups. Polymerizes readily above 150°C. and in presence of UV light,

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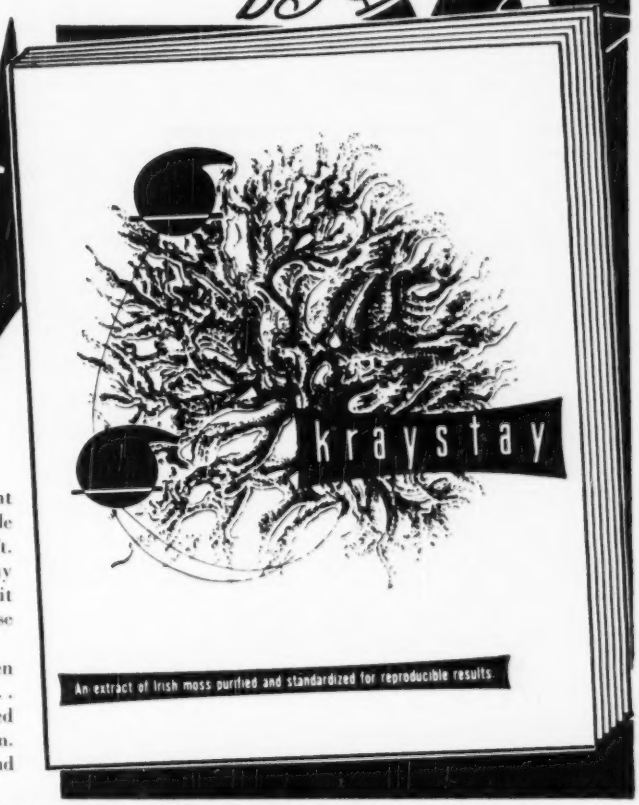

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metals and metallic salts, particularly those of Fe, Cu, Al and Zn. Uses: In the synthesis of pharmaceuticals, plasticizers, dyes, germicides, insecticides, resins, perfume fixatives, flavorings, lubricant additives, solvents, etc. Direct use as an extractant, degreasing solvent, fumigant, polymerization regulator and lachrymator. Availability: Pilot plant quantities. Ohio-Apex, Inc.

2-(2-DIMETHYLAMINOETHYLAMINO)-PYRIDINE

$(CH_3)_2NCH_2CH_2NHC_5H_4N$. M.W., 165.2; B.P., about 265°C.; Sp. G., 0.99 @ 25°/4°C.; yellow to brown clear liquid; miscible in water, alcohol, and benzene. Suggested use: In the preparation of antihistaminics and other pharmaceuticals. Availability: Commercial quantities. Monsanto Chemical Co., Organic Div.

β-DIMETHYLAMINOPROPIONITRILE

$(CH_3)_2NC_2H_4CN$. M.W., 98.15; colorless mobile liquid; M.P., —44.2°C.; B.P., 172°C. (760 mm.); Sp. G., 0.8617 @ 30°C., R.I., n_D^{30} 1.4244; flash pt (Tagliabue closed cup), 63.9°C.; pH of a 1% aq. solution, 9.7; miscible with water and common organic solvents. Chemical properties: Undergoes the usual reactions of the nitrile grouping, including hydrolysis, reduction, and esterification, in addition to condensation reactions involving the activated hydrogens on the carbon adjacent to the nitrile group. Readily forms typical amine salts. Suggested uses: Solvent, insecticide, fungicide, intermediate for dyestuffs, synthetic resins, pharmaceuticals. Availability: Trial lot quantities for exptl. investigation. American Cyanamid Co.

3-DIMETHYLAMINOPROPYLAMINE

$(CH_3)_2NC_3H_6NH_2$. M.W., 102.18; colorless liquid; M.P., less than —70°C.; B.P., 133°C. @ 760 mm.; Sp. G., 0.8100 @ 30°C.; R.I., n_D^{30} p, 1.4328; flash pt. (Tagliabue closed cup), 35°C.; pH of a 1% aq. solution, 11.7; miscible with water and common organic solvents. Chemical properties: Forms salts with a variety of acids. Reacts as a primary amine, with aldehydes, ketones, carboxylic acids, acid chlorides and anhydrides, and compounds containing an active halogen. Suggested uses: Intermediate for germicides, pharmaceuticals, dyestuffs, resins, insecticides and surface-active agents. Availability: Trial-lot quantities for exptl. investigation. American Cyanamid Co.

DIMETHYL FUMARATE

$CH_3OOCCH{=}CHCOOCH_3$. M.W., 144.1; M.P., 102°C.; B.P., 192°C.; white powder; sol. in alcohol; insol. in water. Suggested use: As copolymer in polyester resins. Availability: Semi-commercial quantities. Monsanto Chemical Co., Organic Div.

DIMETHYL 3,4,5,6,7,7-HEXACHLORO-3,6-ENDOMETHYLENE-1,2,3,6-TETRAHYDROPHTHALATE (Dimethyl HET)

$C_{11}H_8Cl_6O_4$. M.W., 416.9; M.P., 76°C.; color, white crystalline; odor, none. Chemical properties: Reactions typical of diesters, hydrolysis, ammonolysis; alcoholysis. Suggested uses: Flame resistant plasticizer for cellulose acetate, extreme pressure lubricant additive, and typical uses of esters where a flame resistant property is desirable. Availability: Laboratory samples, pilot plant quantities on short notice. Hooker Electrochemical Co.

DIMETHYL MALEATE

$(—CHCOOCH_3)_2$. M.W., 144.12; Sp. G., 1.1462 @ 25°C.; R.I., 1.4405 @ 25°C.; B.P., 200.4°C. (760 mm.); M.P., —17.5°C.; sol. in water, 8.0% by wt. Chemical properties: Enters into co-polymerization reactions, forms addition products by reaction at the double bond with such substances as acetoacetic ester, ammonia, amines, acids, oxygen cpds., sulfur cpds., etc. Suggested uses: In synthesis of resins, pharmaceuticals, surface-active agents, etc. Availability: Experimental quantities. Commercial Solvents Corp.

N,N DIMETHYL-α-METHYLBENZYL AMINE

$C_6H_5CH(CH_3)N(CH_3)_2$. Pale yellow liquid with mild ammoniacal odor. M.W., 149; Sp. G., 0.905 @ 20/20°C.; R.I., (n_D @ 30°C), 1.4983; B.P., 70°C. @ 11 mm. Chemical properties: Undergoes typical reactions of aliphatic tert. amines; usual reactions on the benzene ring; forms quaternary bases by reaction with alkyl halides. Uses: Prep. of quaternary NH_4 salts; suggested for use in prep. of amine salts or as an emulsifying agent. Available in research quantities for exptl. use. Carbide and Carbon Chemicals Div.

DIMETHYL p-NITROPHENYL THIONOPHOSPHATE

$(CH_3O)_2P(S)OC_6H_4NO_2$. M.W., 263.2; C.P., 25°-30°C.; R.I., 1.55 @ 40°C.; Sp. G., 1.39 @ 25°/25°C.; light amber crystalline compound; miscible with alcohol, acetone and benzene; immiscible with water. Suggested use: For the preparation of insecticidal and miticidal sprays and dusts. Availability: Pilot plant quantities. Monsanto Chemical Co., Organic Div.

2,4-DINITROPHENYL THIOCYANATE

$(NO_2)_2C_6{\bullet}H_3SCN$. M.W., 225.1; M.P., about 135° to 140°C.; golden yellow crystalline powder; slightly sol. in alcohol; sol. in benzene and acetone; insol. in water. Suggested use: As plant fungicide, shortstop in polymerization of synthetic rubber, and intermediate. Availability: Semi-commercial quantities. Monsanto Chemical Co., Organic Div.

DIOCTYL ADIPATE (Polycizer 332)

M.W., 370; Sp. G., 0.925 @ 25/15.5°C.; color, Hazen No., 100 max.; B.P., at 5 mm. Hg., 98% between 210°C.-218°C.; volatility, 3.5 mg/cm²/hour at 150°C.; acid number, 0.075 max.; as % Acetic Acid, 0.0075 max.; odor, practically none; R.I., 1.4465; viscosity, 18 cps. @ 25°C; wt./gal., at 25°C., 7.70 lbs. Excellent low temperature plasticizer; provides good heat and light stability and exceptional high plasticizing properties. Compounds with the usual amount of plasticizer, may be more highly loaded without exceeding the hardness requirements. Suggested uses: As an entire or partial plasticizer in calendering, extrusion, molding, organosol and plastisol processes. Availability: Commercial quantities. Harwick Standard Chemical Co.

DIPROPYLAMINE

$(CH_3CH_2CH_2)_2NH$. M.W., 101.2; physical state, water-white liquid; Sp. G., 0.738-0.745 @ 20°C.; distillation: I.B.P., 105°C. (min.); 95% between 106-110°C.; F.B.P., 112°C. (max.); purity, 98% (min.). Use: Intermediate for organic synthesis. Availability: Pilot plant quantities. Sharples Chemicals, Inc.

DIXYLYL SULFONE

$[(CH_3)_2C_6H_3]_2SO_2$. M.W., 274.1; yellow, insol. liquid; B.P., 184-202°C. (0.8 mm.). Suggested use: As a plasticizer, dielectric, hydraulic fluid, ingredient in subbing compositions. Availability: Research quantities. Monsanto Chemical Co., Merrimac Div.

o-ETHOXYBENZOIC ACID

$C_2H_5OC_6H_4CO_2H$. Mol. Wt., 166.17; M.P., 19-20°C.; B.P., ca 300°C. (dec.); white powder; sl. sol. in cold water, sol. in hot water. Suggested uses: As an intermediate. Available in laboratory quantities. Heyden Chemical Corp.

p-ETHOXYBENZOIC ACID

$C_2H_5OC_6H_4CO_2H$. Mol. Wt., 166.17; M.P., 195-196°C., white solid; very sl. sol. in hot water. Suggested uses: As an intermediate. Available in laboratory quantities. Heyden Chemical Corp.

o-ETHOXYBENZOYL CHLORIDE

$C_2H_5OC_6H_4COCl$. Mol. Wt., 184.62; colorless liquid; B.P., 172-184°C. at 50 mm. Chlorine content, 19.0% (calculated 19.25%). Sol. in organic solvents, insol. in water. Suggested uses: As an intermediate. Available in laboratory quantities. Heyden Chemical Corp.

p-ETHOXYBENZOYL CHLORIDE

$C_2H_5OC_6H_4COCl$. Mol. Wt., 184.62; colorless liquid; B.P., 170-171°C. at 35 mm., chlorine content, 19.2% (calculated 19.25%). Suggested uses: as an intermediate. Available in laboratory quantities. Heyden Chemical Corp.

3-ETHOXYPROPIONALDEHYDE

$CH_3CH_2OCH_2CH_2CHO$. M.W., 102.13; Sp. G., 0.9181 @ 20/20°C.; B.P., 30°C. @ 10 mm., 135.2°C. @ 760 mm.; Vap. P., 5.5 mm. Hg @ 20°C.; M.P., —69.4; sol. in water, complete; sol. water in, complete; viscosity @ 20°C., 0.85 cps.; R.I., 1.4030 @ 20°C.; flash pt. (Cleveland Open Cup), 100°F. Chemical properties: Undergoes normal reactions of aldehydes incl. condensation with amines and active methylene groups. Uses: Chemical intermediate. Available in pilot-plant quantities. Carbide and Carbon Chemicals Div.

6-ETHOXY-2,2,4-TRIMETHYL-1,2-DIHYDROQUINOLINE (Santoflex AW)

$C_{14}H_{19}NO$. M.W., 217.3; Condensation product p-phenetidine and acetone. Dark viscous liquid; Sp. G., 1.030-1.040 @ 45°C.; flash pt. (C.O.C.), 250°F. min.; sol. in benzene, toluene, acetone, methanol, diethyl ether. Suggested use: As an anti-weathering agent and antioxidant for natural and synthetic rubbers. Availability: Commercial quantities. Monsanto Chemical Co., Rubber Service Dept., Organic Div.

o-ETHYLANILINE (o-aminoethylbenzene)

$NH_2C_6H_4C_2H_5$. M.W., 121.2; B.P., about 215°C.; R.I., 1.56 @ 25°C.; Sp. G., 0.980 @ 25°/25°C.; colorless liquid, darkens on standing; miscible in alcohol and benzene; slightly miscible in water. Suggested use: As a chemical intermediate in dyestuff, rubber and other fields. Availability: Semi-commercial quantities. Monsanto Chemical Co., Organic Div.

ETHYL BENZYL CHLORIDE (Mixed Isomers)

$CH_3CH_2C_6H_4CH_2Cl$. M.W., 154.66; Sp. G., 1.047 @ 25°/4°C.; R.I., 1.530@ @ 25°C.; B.P., 99-104°C. (15 mm.); Vap. P., @ 50°C., 0.8 mm. Hg; Vap. P., @ 100°C., 15 mm. Hg; chlorine, 22.7%; insol. in H_2O; compl. miscible with gasoline, benzene, EtOH and isopropyl ether; M.P., about —18°C.; visc., 1.8 cps. @ 20°C.; surf. tens., 33.4 dynes/cm. @ 20°C.; sp. heat (50-100°C. avg.), 0.36 cal./gm./°C.; lat. heat of vap. (calc.), 14 kcal./mole; odor, penetrating and pungent, lachrymatory; color, water-white to pale yellow; O. and P. isomers with latter predominating. Chemical properties: Undergoes the reactions typical of benzyl chloride. Ease of replcmt. of Cl-atom greater than for benzyl chloride. Chloromethyl group can be further halogenated, oxidized and reduced. Aromatic nucleus can be sulfonated, nitrated, halogenated, etc., with due regard for the activity of the substituent groups. Polymerizes readily above 150°C. and/or in the presence of UV light, metals and metallic salts, particularly those of Fe, Cu, Al, and Zn. Suggested uses: In the synthesis of pharmaceuticals, plasticizers, dyes, germicides, insecticides, resins, perfume fixatives, flavorings, lubricant additives, solvents and other organic chemicals. Direct use as an extractant, degreasing solvent, fumigant, polymerization regulator and lachrymator. Availability: Commercial quantities; also as crude reaction product, containing 80-85% ethyl benzyl chloride. Ohio-Apex, Inc.

ETHYL n-BUTYL ETHER

$CH_3CH_2OC_4H_9$. M.W., 102.17; Sp. G., 0.7528 @ 20/20°C.; B.P., 92.2°C. @ 760 mm., 23°C. @ 50 mm., —7°C. @ 10 mm.; Vap. P., 43 mm. Hg @ 20°C.; M.P., —130°C.; sol. in water, 0.44% by wt. @ 20°C.; sol. water in, 0.8% by wt. @ 40°C.; R.I., 1.3827 @ 20°C.; flash pt. (Cleveland Open Cup), 40°F.; forms heterogeneous CBM with water (87.9% ether by wt.), boiling @ 92°C. (760 mm.). Uses: Extractant, inert reaction medium. Available in commercial quantities. Carbide and Carbon Chemicals Div.

ETHYL FORMATE ANHY.

$HCOOC_2H_5$. M.W., 74.08; purity, 95% min.; moisture, 2% max.; Sp. G., 0.923° @ 20/4°C.; M.P., —79°C.; B.P., 54°C. @ 760 mm.; sol. in water; inf. sol. in alcohol and ether; colorless liquid. Chemical properties: May be used to introduce the formyl group into organic compounds. Suggested uses: In the synthesis of dyes, pharmaceuticals, vitamins, etc. Availability: Commercial quantities. American-British Chemical Supplies, Inc., Kay-Fries Chemicals, Inc.

ETHYLENE TRITHIOCARBONATE (1,3 dithiolane 2 thione)

$(CH_2S)_2CS$. M.W., 136.3; M.P., 34.5-35.0°C.; B.P., 117-118°C. (0.6 mm.); 13 lbs./gal. (solid); flash pt. (Tag closed cup), 165.5°C.; Sp. G., 1.48; R.I., 1.73; sol. in $CHCl_3$, ethyl acetate, acetone, ethyl ether, benzene; slightly sol. in ethanol, acetic acid, CCl_4, ethanol; insol. in H_2O, petrol. ether. Undergoes hydrolysis, oxidation, chlorination. A bright yellow to brown cryst. solid; no odor when pure, but tech. grade may contain S-cpds. Use: As flotation agent, sulfur solvent, organic intermediate, extreme press. lub., aphicide, scalicide. Research samples available. Stauffer Chemical Co.

2-ETHYLHEXYL ACRYLATE

$CH_2{:}CHCOOCH_2CH(C_2H_5)C_4H_9$. M.W., 184.25; Sp. G., 0.8869 @ 20/20°C.; B.P., 130°C. @ 50 mm.; Vap. P., 0.09 mm. Hg @ 20°C.; M.P., sets to a glass below —90°C.; sol. in water, < 0.01% by wt. @ 20°C.; sol. water in, 0.15% by wt. @ 20°C.; viscosity, 1.70 cps. @ 20°C.; flash pt. (Cleveland Open Cup), 180°F.; chemical properties: Polymerizes readily with itself or other vinyl monomers; unsat. group reacts readily to add halogens, etc. Uses: As a copolymer to impart internal plasticity. Polymers and copolymers are useful in adhesives, paper treating, specialty rubbers, textile processing, protective coatings, leather coatings. Available in pilot-plant quantities. Carbide and Carbon Chemicals Div.

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• Typical reactions of CYANOACETIC ACID •

ESTERIFICATION	•	$CNCH_2COOH + ROH \rightarrow CNCH_2COOR + H_2O$
AMIDATON	•	$CNCH_2COOH + HNRR^1 \rightarrow CNCH_2CONRR^1 + H_2O$
CHLORINATION	•	$CNCH_2COOH + PCl_3 + Cl_2 \rightarrow CNCH_2COCl + POCl_3 + HCl$
HYDROLYSIS	•	$CNCH_2COOH + H_2O \rightarrow CH_2(COOH)_2 + NH_3$
REDUCTION	•	$CNCH_2COOH + 2H_2 \rightarrow NH_2CH_2CH_2COOH$
CONDENSATION	•	$CNCH_2COOH + RCOR^1 \rightarrow RR^1C = C(CN)COOH + H_2O$

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ash • .075% maximum.

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o-ETHYLNITROBENZENE

$C_8H_9C_6H_4NO_2$. M.W., 151.1; C. P., about —12° to —14°C.; Sp. G., 1.1 @ 25°/25°C.; R. I., 1.53 @ 25°C.; B.P., about 228°C.; yellow to green clear liquid; miscible in most organic solvents; immiscible in water. Suggested use: As intermediate in dyestuff, pharmaceutical, etc. Availability: Commercial quantities. Monsanto Chemical Co., Organic Div.

p-FORMYLACETANILIDE

$CH_3C(O)NHC_6H_4CHO$. M.W., 236.3; M.P., about 155°C.; light yellow crystalline powder; sol. in water (10% at boiling); sol. in alcohol and acetone. Suggested use: As intermediate in pharmaceutical and other fields. Availability: Semi-commercial quantities. Monsanto Chemical Co., Organic Div.

p-FORMYLACETANILIDE THIOSEMICARBAZONE

$CH_3C(O)NHC_6H_4CHNNHC(S)NH_2$. M.W., 236.3; M.P., decomp. about 225°C.; white to yellow-white crystalline powder; slightly sol. in alcohol and acetone; very slightly sol. in water. Suggested use: In antitubercular therapy. Availability: Commercial quantities. Monsanto Chemical Co., Organic Div.

GLYCIDYL PHENYL ETHER (Phenoxy Propylene Oxide)

Sp. G., 1.105-1.115 @ 20°/20°C.; purity (based on Epoxide content), 98% mm.; color, Pt-Co. 30 max. An effective stabilizer of halogenated compounds; has exceptionally high solvency for halogenated materials and is compatible in nearly all formulations where its use as a stabilizer is indicated. In view of this solvency, it has been suggested as a "blender" for more difficult soluble ingredient, also suggested as an intermediate for synthesis of monomeric and polymeric glycerol deriv. containing the phenoxy group. Shell Chemical Corp.

GLYCOLIC ACID (Crystalline) (Hydroxy Acetic Acid)

$CH_2OHCOOH$. M.W., 76.03; fine, white, crystalline powder (pure grade), or colorless plates. (C.P. grade, M.P., 79-80°C.) Sol. in water, alcohol, ether. Suggested uses: Synthesis of esters and salts. Availability: Pure grade, semi-commercial; CP grade, laboratory scale. City Chemical Corp.

3,4,5,6,7,7-HEXACHLORO-3,6-ENDOMETHYLENE-1,2,3,6-TETRAHYDROPHTHALIC ANHYDRIDE (HET)

$C_9H_2Cl_6O_3$. M.W., 370.8; M.P., 230-234°C.; white crystalline; odor, slight sharp. Chemical properties: Undergoes typical reactions of acid anhydrides; alcoholysis, hydrolysis, ammonolysis. Cl-atoms in ring are stable and quite inert chemically. Suggested uses: Dye intermediate, flame resistant alkyd resins, and intermediate for fire resistant esters. Availability: Laboratory samples, pilot plant quant. on short notice. Hooker Electrochemical Co.

n-HEXYL FORMATE

$CH_3(CH_2)_5O_2CH$. A colorless liquid; very sol. in benzene and CCl_4. Suggested uses: Intermediate for organic synthesis, as a plasticizer and solvent. Available in exptl. quantities. Mathieson Chemical Corp.

DL-HOMOCYSTEINE

$C_5H_{10}N_2O_4S_2$. M.W., 268.224; pinkish white to white crystals; M.P., 231°-232°C. with evolution of gas; sol. in water; insol. in ethyl ether and alcohol. Availability: Laboratory scale. General Biochemicals, Inc.

HYDRAZINIUM BENZOATE

$C_7H_{10}O_2N_2$. A white free-flowing powder; M.P., 115-117°C.; decomposes at 165-170°C.; very sol. in water and ethyl alcohol; insol. in benzene and CCl_4. Suggested uses: Corrosion inhibitor, anti-oxidant and intermediate for organic synthesis. Available in exptl. quantities. Mathieson Chemical Corp.

2-HYDROXYETHYLTRIMETHYLAMMONIUM BICARBONATE

$(CH_3)_3N(C_2H_4OH)\bullet HCO_3$. M.W., 165.88; density, 45% aq. sol'n, 1.0965 g/ml. @ 25°C. Efficient alkaline catalyst for condensation reactions; raw material for synthesis; product decomposes at elevated temp. Availability: Drum quantities, as 45% aq. sol'n. Commercial Solvents Corp.

β,β'-IMINODIPROPIONITRILE

$NCC_2H_4NHC_2H_4CN$. M.W., 123.16; colorless liquid; M.P., —5.50°C.; B.P., 162°C. (5 mm.); Sp. G., 1.0165 @ 30°C.; R.I., $n^{30}D$, 1.4622; viscosity, 2.85 cps. @ 30°C.; surf. tens., 47.7 dynes/cm. @ 30°C.; flash pt. (Tagliabue closed cup), >80°C.; pH of a 10% aq. solution, 8.9; miscible with aliphatic hydrocarbons; able to selectively extract aromatics from paraffin; thermally unstable above 175°C. Chemical properties: The nitrile group may be readily hydrated, hydrolyzed, esterified and reduced; forms amine salts with acids; can be arylated, alkylated, diazotized, and reacted with active halogens as a sec. amine. Suggested uses: Solvent and selective solvent, intermediate for plasticizers, wetting agents, insecticides, pharmaceuticals. Availability: Trial-lot quantities for exptl. invesitgations. American Cyanamid Co.

IMINOTRIACETIC ACID

$N(CH_2COOH)_3$. M.W., 191; white crystalline powder, insol. in water, sol. in alkali, mineral acid, formamide; M.P., (w. decomp.), 220°C. Complexing agent for alkali earths and heavy metals. Suggested uses: Intermediate for pharmaceuticals, plasticizers; separation of rare earths. Available in commercial quantities. Alrose Chemical Co.

IRON (ic) ARSENITE

$FeOH(H_2AsO_3)_2$. Composition somewhat variable; brownish-yellow, odorless powder; insol. in water; sol. in acids, also in cold NaOH sol'n. Used medicinally. Amend Drug & Chem. Co.

IRON MALATE

$Fe_2(C_4H_4O_5)_3$. Brown hygroscopic scales; slowly sol. in water. Used medicinally for tonic administration of iron. Amend Drug & Chem. Co.

ISOBUTYLAMINE

$(CH_3)_2CHCH_2NH_2$. M.W., 73.1; Sp. G., 0.73-0.74 @ 20°/20°C.; physical state, water-white liquid; purity, 97% (min.); distillation: I.B.P., 64°C.; 95% between 64-71°C.; F.B.P., 75°C.; visc. @ 60°C., 0.33 cps.; sol. in water and most organic solvents. Uses: Intermediate for pharmaceuticals, dyestuffs, lubricating oil additives and textile chemicals. Availability: Commercial quantities. Sharples Chemicals, Inc.

ISOPROPENYL ACETATE

$CH_2{:}C(CH_3)OCO\bullet CH_3$. M.W., 100.11; Sp. G., 0.9226 @ 20/20°C.; B.P., 97.5°C. @ 760 mm.; Vap. P., 30 mm. @ 20°C.; M.P., —92.9°C.; sol. in water, 3.25% by wt. @ 20°C, sol. water in, 1.21% by wt. @ 20°C.; viscosity, 0.6 cps. @ 20°C.; R.I., 1.4002 @ 20°C.; heat of vaporiz., 158 Btu/lb.; coeff. of expan., 0.00123 @ 20°C.; flash pt. (Cleveland Open Cup), 60°F. Chemical properties: Reacts with alcohols to yield acetic esters; with amines to yield corres. N-subst. acetamides; with acids to yield mixed anhydrides; adds halogens to form α,β-di-substituted esters; polymerizes slowly; copolymerizes readily with cpds. such as maleic esters and vinyl chloride. Uses: Copolymerization; organic synthesis; as an acetylating agent in reactions in which acetone is obtained as a by-product rather than acetic acid. This is advantageous in the acetylation of cpds. which would dehydrate in the presence of acetic anhydride. Available in commercial quantities. Carbide and Carbon Chemicals Div.

3-ISOPROPOXYPROPYLAMINE

$(CH_3)_2CHOC_3H_6NH_2$. M.W., 117.2; colorless liquid; B.P., 147°C. (760 mm.); Sp. G., 0.845 @ 20°C.; R. I., $n^{20}D$, 1.4164; pH of a 1% aq. solution, 11.6; miscible with water and common organic solvents; forms a min. const-boiling mixt. with water (33% amine by weight). Chemical properties: Forms salts with a variety of acids; reacts as a primary amine with aldehydes, ketones, carboxylic acids, acid chlorides and anhydrides, and compounds containing an active halogen. Suggested uses: Preparation of amine soaps, dye solvents and textile assistants; intermediate for dyestuffs, pharmaceuticals, insecticides and surface active agents. Availability: Trial-lot quantities for exptl. investigation. American Cyanamid Co.

3-ISOPROPYLAMINOPROPYLAMINE

$(CH_3)_2CHNHC_3H_6NH_2$. M.W., 116.2; colorless liquid; B.P., 159°C., (760 mm.); Sp.G., 0.827 @ 25°C.; R. I., $n^{25}D$, 1.4394; pH of a 1% aq. solution, 12.0; miscible with water and common organic solvents. Chemical properties: Forms salts with a variety of acids; reacts as a primary amine, with aldehydes, ketones, carboxylic acids, acid chlorides and anhydrides, and compounds containing an active halogen. Suggested uses: Intermediate for germicides, pharmaceuticals, dyestuffs, resins, insecticides and surface-active agents. Availability: Trial-lot quantities for exptl. investigation. American Cyanamid Co.

β-ISOPROPYLAMINOPROPIONITRILE

$(CH_3)_2CHNHC_2H_4CN$. M.W., 112.18; colorless liquid; M.P., below —20°C.; B.P., 86-87°C. (17 mm.); Sp. G., 0.864 @ 25°C.; R.I., $N^{25}D$, 1.4290; flash pt. (open cup), >40.6°C.; pH of 1% aq. sol'n, 10; miscible with water and common organic solvents. Chemical properties: Undergoes usual reactions of nitrile grouping, incl. hydrolysis, reduction and esterification, condensation reactions involving the activated hydrogens on the carbon adjacent to nitrile group; readily forms typical amine salts; can be arylated and akylated in a manner common to sec. amines. Suggested uses: Solvent, insecticide, intermediate for dyestuffs, synthetic resins, pharmaceuticals. Availability: Trial-lot quantities for exptl. investigation. American Cyanamid Co.

ISOPROPYL BENZOATE

$C_6H_5COOCH(CH_3)_2$. Colorless liquid. M.W., 164.2; B.P., 218.5°C. @ 760 mm.; Sp. G., 1.016 @ 15/4°C.; flash pt. (Cleveland Open Cup), 210°F.; substantially insol. in water; sol. in alcohol and organic solvents; odor, pleasantly aromatic. Chemical properties: Undergoes ester exchange using customary catalysts to form other esters; rapidly reactive source of the benzoyl radical; undergoes the usual reactions of esters on reduction, or other treatment. Uses: Alkyd resin manufacture to control cross-linking, chemical intermediate for manufacture of other esters such as benzyl benzoate; high boiling solvent for inks, dyes, resins; odorant. Available in commercial quantities. Carbide and Carbon Chemicals Div.

ISOPROPYL CATECHOL

$(CH_3)_2C{-}C_6H_3(OH)_2$. M.W., 151.18; B.P., 172-3°C. at 50 mm.; R.I., 1.5452 @ 20° C.; Sp. G., 1.1035 @ 20°/4°C.; clear light-colored liquid; mild phenolic odor. A substituted dihydric phenol that undergoes typical reactions of: Esterification, hydrogenation, halogenation, nitration, sulfonation, carboxylation, alkylation, oxidation, etherification, condensation, and acylation. Suggested uses: An anti-skinning agent for paints and varnishes; antioxidant for oils and fats; synthesis of organic cpds. Availability: Semi-commercial. Koppers Co., Inc., Chemical Div.

ISOPROPYL TRICHLOROACETATE

$CCl_3COOCH(CH_3)_2$. M.W., 205.2; B.P., 101°C. @ 69 mm.; Sp. G., 1.292 (25/15); R.I., 1.4428 (20/n); free acidity, nil; pleasant ester-like odor, non-corrosive to skin; water white, mobile liquid. Suggested uses: Weed killer formulations, pharmaceuticals, dye intermediates; solvent for synthetic rubbers. Availability: Semi-commercial quantities. Hooker Electrochemical Co.

LITHIUM BOROHYDRIDE

$LiBH_4$ • M.W., 21.8; Sp. G. 0.66 g/cc @ 25°C.; M.P., 280°C. with decompos.; ΔH_f, 44.1 kcal.; white, odorless, microcrystalline substance which reacts rapidly with humid air or moisture in any form; may ignite when dropped in water; sol. with reaction in lower alcohols; very sol. in low-mole. weight, primary amines; slightly sol. in diethyl ether; moderately sol. in tetrahydrofuran. Chemical properties: A vigorous reducing agent for aldehydes, ketones, and acid chlorides which are reduced quantitatively; reduces CO_2 to formic acid; reacts slowly or not at all with esters, anhydrides, nitriles, nitro cpds.; does not in general react with alkyl halides or olefinic double bonds. Suggested uses: Synthesis of pharmaceuticals and isotopetagged compounds; prep. of other borohydrides; as a source of hydrogen (1 g. reacts with water to yield more than 4 l. of hydrogen). Availability: Small quantities for exptl. studies. Metal Hydrides Inc.

LITHIUM CHROMATE

$Li_2CrO_4\bullet 2H_2O$. M.W., 165.92; yellow, hygroscopic crystals; very sol. in water; 8.37% Li. Suggested uses: Corrosion inhibitor in Mg dry-cell batteries. Availability: Commercial quantities. Chemo Puro Mfg. Corp.

LITHIUM HYDROXYSTEARATE

app. $C_{18}H_{35}O_3Li$. M.W., app. 290; white, odorless powder; very slightly sol. in hot water and hot alcohol; 2.3% Li. Suggested use: Ingredient of multipurpose greases. Availability: Commercial quantities. Chemo Puro Mfg. Corp.

LITHIUM METABORATE

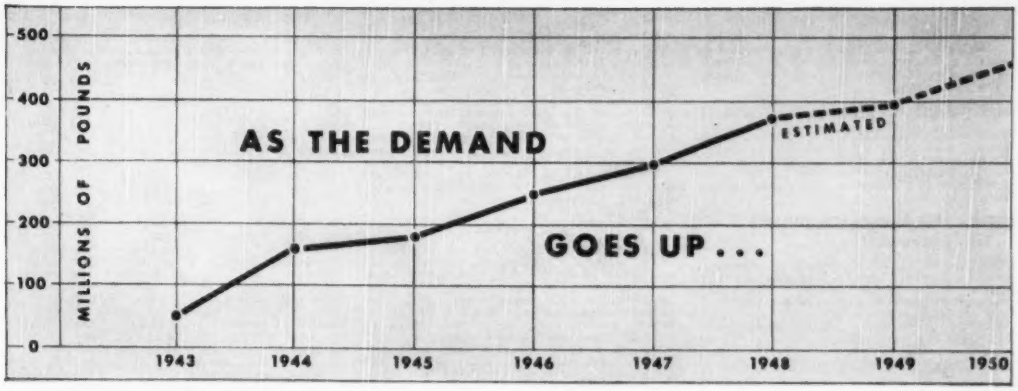
$LiBO_2$. White powder; slightly sol. in water. Used as reagent and flux. Amend Drug & Chem. Co.

LITHIUM OLEATE

app. $C_{18}H_{33}O_2Li$. M.W., 288; white odorless powder; sol. in hot water and alcohol; 2.4% Li. Suggested uses: Jelling agent in paint removers, greases, etc. Availability: Commercial quantities. Chemo Puro Mfg. Co.

MAGNESIUM GLUCONATE

$(C_6H_{11}O_7)_2Mg\bullet 2H_2O$. M.W., 450; white, odor-



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less powder; sol. in water, insol. in alcohol; 5.4% Mg. Suggested uses: In pharmaceuticals where a non-purgative Mg-salt is required. Availability: Commercial quantities. Chemo Puro Mfg. Corp.

MANGANESE ACETYLCHOLINE CHLORIDE

$Mn(C_7H_{18}O_2NCl)_2$. M.W., 485; pink, stable powder; very sol. in water; insoluble in organic solvents; 11.4% Mn. Suggested uses: In medicines, as an orally active acetylcholine derivative. Availability: Commercial quantities. Chemo Puro Mfg. Corp.

MANGANESE PHOSPHATE, DIBASIC (Std. Luminescent)

$MnHPO_4$. M.W., 150.92; fine, pink, crystalline powder; odorless; very slightly sol. in water; sol. in dil. acids. An unusually high purity manganese phosphate. Suggested use: Manufacture of halo-phosphate phosphors and other phosphors. Availability: Commerical quantities. Mallinckrodt Chemical Works.

MANGANOFERRO PHOSPHATE

A black, opaque powder of definite mixture of manganous and ferrous phosphates and oxides. Sp. G., 4.30; apparent density, 144 lb./ft^3. Typical analysis: Fe: 16.8%, MnO: 57.2%, P_2O_5: 12.3%. Sol. in mineral acids incl. phosphoric acid. Suggested uses: In stock foods to provide nutritional requirements of Mn, Fe, P; in fertilizer to provide trace elements and in the prep. of rust proofing baths. Availability: Commercial quantities. Victor Chemical Works.

2-MERCAPTO IMIDAZOLINE (NA-22)

M.W., 102; Sp. G., 1.43; white crystalline powder; non-staining, non-discoloring accelerator of vulcanization for neoprene chemical rubber. Commercially available. E. I. du Pont de Nemours and Co., Inc., Rubber Chemicals Div.

METHACROLEIN

$CH_2{:}C(CH_3)CHO$. Water-white liquid. M.W., 70.1; Sp. Gr., 0.8474 @ 20/20°C.; B.P., 68.0°C. @ 760 mm.; M.P., —81.0°C.; R.I., 1.4169 @ 20°C.; viscosity, 0.49 cps. @ 20°C.; sol. in water, 5.9% by wt. @ 20°C.; sol. of water in, 1.7% by wt. @ 20°C. Chemical properties: Both the unsat. double bond and the aldehyde group can be made to react independently in the reactions characteristic of those groups. Halogens will add readily in alcoholic sol. to form the halogenated acetals. The aldehyde group will react with amines, active methylene groups, sodium bisulfite, etc., in the usual manner. Uses: Organic syntheses; as a copolymer in specialty rubbers and plastics. Available in commercial quantities, min. purity of 90%; exptl. quantities of higher purity. Carbide and Carbon Chemicals Div.

METHACRYLAMIDE

$CH_2{:}C(CH_3)CONH_2$. M.W., 85; M.P., 109-110°C.; miscible in water in all proportions; sol. in most organic solvents. Chemical properties: Can be polymerized to yield either a water-sol. or water-insol. polymer. Water-sol. form may be insolubilized by heating, addition of acid, or treatment with formaldehyde or metal salts. Can be copolymerized with other monomers to vary properties. Suggested uses: Impregnation of wool and other fibers in monomeric form, followed by polymerization and cross-linking with formaldehyde, metal salts, etc.; copolymerization with methacrylic acid for use as textile-sizing agent; insolubilization of the polymers and copolymers offers possibilities in the fields of coating resins, adhesives, impregnating agents for textiles, paper, etc. Availability: Exptl. and pilot-plant quantities. Rohm & Haas Co., Dept. SP.

o-METHOXYBENZOIC ACID

$CH_3OC_6H_4CO_2H$. Mol. Wt., 152.14; white solid; M.P., 98°-101°C.; B.P., 200°C.; sp. gr., 1.180; sol. in water at 20°C., 0.4g./100 ml.; at 95°C., 2.0g./100 ml., in chloroform at 20°C., 20g./100 ml.; at 60°C., very sol.; in glacial acetic acid at 20°, very sol.; in ethanol at 20°C., very sol. Suggested uses: As an intermediate. Available in laboratory quantities. Heyden Chemical Corp.

o-METHOXYBENZOYL CHLORIDE

$CH_3OC_6H_4COCl$. Mol. Wt., 170.59; colorless liquid; B.P., 73°C. at 0.3 mm. Sol. in organic solvents; insol. in water. Chlorine content, 20.2% (calculated 20.8%). Suggested uses: As an intermediate. Available in laboratory quantities. Heyden Chemical Corp.

β-METHOXYPROPIONITRILE

$CH_3OC_2H_4CN$. M.W., 85.10; colorless, mobile liquid; M.P., —62.9°C.; B.P., 160°C. (760 mm.); Sp. G., 0.9299 @ 30°C.; R.I., n_D^{25}, 1.4015; flash pt. (Tagliabue closed cup), 65°C.; pH of a 1% aq. solution, 5.4; sol. in water, 33.5% @ 25°C.; miscible with common organic solvents. Chemical properties: Undergoes the usual reactions of the nitrile grouping, incl. hydrolysis, reduction, and esterification. The presence of the nitrile group activates the hydrogen atoms on the adjacent carbon; condenses readily with esters. Suggested uses: Solvent, especially for vinyl polymers; plasticizer, insecticide, intermediate for dyestuffs, synthetic resins, pharmaceuticals. Availability: Trial-lot quantities for exptl. investigation. American Cyanamid Co.

3-METHOXYPROPYLAMINE

$CH_3OC_3H_6NH_2$. M.W., 89.14; colorless liquid; M.P., —75.7°C.; B.P., 116°C. (760 mm.); Sp. G., 0.8615 @ 30° C.; R.I., n_D^{25}, 1.4153; flash pt. (Tagliabue closed cup), 32.2°C.; pH of a 1% aq. solution, 11.7; miscible with water and common organic solvents; forms a min. const. boiling mixture with water (5% amine by weight); forms salts with a variety of acids; reacts as a primary amine, with aldehydes, ketones, carboxylic acids, acid chlorides and anhydrides, and cpds. containing an active halogen. Suggested uses: Prep. of emulsions and finishes wherein a volatile alkaline constituent is desired; prep. of amine soaps, dye solvents, textile assistants; intermediate for dyestuffs, resins, pharmaceuticals, insecticides and surface-active agents. Availability: Trial-lot quantities for exptl. investigation. American Cyanamid Co.

α-METHYLBENZYL AMINE

$C_6H_5CH(CH_3)NH_2$. Water-white liquid; mild ammoniacal odor; M.W., 121; Sp. G., 0.954 @ 20/20°C.; R.I., (n_D @ 30°C.), 1.5223; B.P., 189°C. @ 760 mm.; limited sol. in water; sol. in most organic solvents and hydrocarbons. Chemical properties: Undergoes typical reactions of aliphatic primary amines; usual reactions on the benzene ring are possible when amine group is protected by acetylation. Suggested uses: Prep. of amine salts and amides; as emulsifying agent; in acid gas absorption; prep. of gas-fade "resists" and textile specialties. Available in research quantities for exptl. use. Carbide and Carbon Chemicals Div.

α-METHYLBENZYL ETHER (di(1-phenyl ethyl) ether)

$C_6H_5CH(CH_3)OCH(CH_3)C_6H_5$. Straw yellow, mobile liquid; faint "green" odor; M.W., 226; Sp. G., 1.014 @ 20/20°C.; B.P., 340°C. @ 760 mm.; sol. in most organic solvents; nearly insol. in water. Chemical properties: Dehydrates readily to styrene; hydrolyzes under acid conditions to phenyl methyl carbinol; other reactions typical of sec. aliphatic ether; most reactions on benzene ring result in poor yields because of tendency to dehydrate to styrene and polymerize. Suggested uses: High boiling inert solvent (except under dehydrating conditions); high boiling styrenating agent for alkyd and oleoresinous varnish constituents. Available in research quantities for exptl. use. Carbide and Carbon Chemicals Div.

α-METHYLBENZYL MONOETHANOLAMINE

$C_6H_5CH(CH_3)NHC_2H_4OH$. Pale yellow liquid; mild ammoniacal odor; M.W., 165; Sp. G., 1.041 @ 20/20°C.; R.I. (n_D @ 30°C.), 1.5305; B.P., 96°C. @ 2 mm.; slightly sol. in water; sol. in most organic solvents. Chemical properties: Undergoes reactions typical of sec. aliphatic amines; when the amine and hydroxyl groups are protected by acetylation the usual reactions on the benzene ring are possible; the hydroxyl group may be esterfied. Suggested uses: Emulsifying agent, prep. of amine salts and amides. Available in research quantities for exptl. use. Carbide and Carbon Chemicals Div.

METHYLCHLOROMETHYL ETHER

$CH_3{-}O{-}CH_2Cl$. M.W., 80.52; Sp. G., 1.064-1.071 25/15.5°C.; boiling range, 43-76°C. (745-750 mm.); chlorine content, 40-41%; purity 90-94%; color, water white; odor, sharp, pungent. Suggested uses: Synthesis of thiocyano insecticides, quaternary ammonium compounds, and general chloromethylations. This chlorine atom is extremely active. Availability: Semi-commercial scale. Hooker Electrochemical Co.

α-METHYLBENZYL DIETHANOLAMINE

$C_6H_5CH(CH_3)N(C_2H_4OH)_2$. Pale yellow liquid; mild ammoniacal odor; M.W., 209; Sp. G., 1.078 @ 20/20°C.; R.I. (n_D @ 30°C.), 1.5329; B.P., 152°C. @ 2 mm.; slightly sol. in water; sol. in most organic solvents. Chemical properties: Undergoes reactions typical of aliphatic tert. amines, usual reactions on the benzene ring are possible when hydroxyl groups are protected by acetylation; forms quaternary bases by reaction with alkyl halides. Suggested uses: Prep. of amine salts; as emulsifying agent; prep. of quaternary NH_4 salts for detergents and germicides. Available in research quantities for exptl. use. Carbine and Carbon Chemicals Div.

METHYL DICHLOROACETATE

$Cl_2CHCOOCH_3$. M.W., 142.96; Sp. G., 1.360-1.385 @ 25/25°C.; R.I., 1.4350-1.4450 @ 25°C.; acidity (as dichloroacetic acid), 0.5% max.; assay, 97.0% min. Available commercially. The Dow Chem. Co.

2-METHYL-5-ETHYL PYRIDINE

$C_8H_{11}N$. M.W., 121.2; Sp. G., 0.920 @ 20/20° C.; B.P., 174°C. @ 760 mm., 44°C. at 6 mm.; R.I., 1.4970 @ 20°C.; flash pt. (Cleveland open cup), 160°F.; inso. in water; sol. in most organic solvents; acute oral toxicity on white rats, approx. the same as pyridine. Avoid contact with eyes because of alkalinity. Uses: Prep. of other subst. pyridines, e.g., 2-vinyl-5-ethyl pyridine and 2-methyl-5-vinyl pyridine, which may be used in copolymerization reactions; prep. of nicotinic acid and its amide; prep. of quaternary germicides and cationic textile finishes; as potential corrosion inhibitor for chlorinated solvents. Available in commercial quantities. Carbide and Carbon Chemicals Div.

METHYL p-TOLUENESULFONATE

$CH_3OSO_2C_6H_4CH_3$. M.W., 186.2; Sp. G., 1.23 @ 25°/25°C.; C.P., 26° to 27°C.; white to light yellow liquid or crystals; sol. in alcohol and benzene; insol. in water. Suggested use: As a selective methylating agent. Availability: Commercial quantities. Monsanto Chemical Co., Organic Div.

MONOCHLOROPENTADECAFLUORODIMETHYLCYLOHEXANE

$C_8F_{15}Cl$. M.W., 416.5; B.P., approx. 129°C.; Sp. G., 1.869 @ 20°C.; R.I., 1.3170 @ 25°C.; dielec. const., 2.03 @ .1-100 Kc; dielec. strength, 12,900 volts; D.C. resistivity, 1.6×10^{12} ohm-cm. Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C.; resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100° C. Possible uses: Heat transfer medium, electrical insulating fluid, inert reaction fluid, power transmission liquid, thermometric or manometric fluid. Availability. Small quantities for exptl. investigations. E. I. du Pont de Nemours and Co., Inc., Rubber Chemicals Div.

MONO-DIOCTYL ACID ORTHOPHOSPHATE

Light amber liquid; faint odor of octyl alcohol; insol. in water; miscible in all proportions with common organic solvents; becomes viscous without freezing at —40°C. Sp. G., 1.021 (25°C.); R.I., N_D^{25}, 1.4427; acid no., 312. Suggested uses: Catalyst for thermosetting resins, rust removers, soldering flux, preparation of oil additives, and polymerization agent. Availability: Commercial quantities. Victor Chemical Works.

MONOHYDRAZINE BORATE

$H_7O_3N_2B$. A white free-flowing powder decomposing @ 125-130°C.; very sol. in water; insol. in ethyl alcohol, benzene and CCl_4. Suggested uses: Corrosion inhibitor, flux and reducing agent. Available in exptl. quantities. Mathieson Chemical Corp.

MONOSOLVATED SODIUM ETHYLATE

$NaOC_2H_5{\bullet}C_2H_5OH$. A free-flowing white powder; sol. in methyl and ethyl alcohol. Possesses greater stability to contact with moisture and oxygen than anhyd. sodium methylate; also less heat of reaction when dissolved. Suggested uses: Pharmaceutical manufacture and other synthetic organic preparations. Available in exptl. quantities. Mathieson Chemical Corp.

NICKEL BENZENESULFONATE

$(C_6H_5SO_3)_2Ni{\bullet}6H_2O$. M.W., 481.1; green crystals; sol. in water, alcohol, ether and ammonium hydroxide. Availability: Semi-commercial scale. City Chemical Corp.

NICKEL (ous) CITRATE

$Ni_3(C_6H_5O_7)_2{\bullet}14H_2O$. Pale green, deliquescent powder; sol. in water. Used as reagent. Amend Drug & Chem. Co.

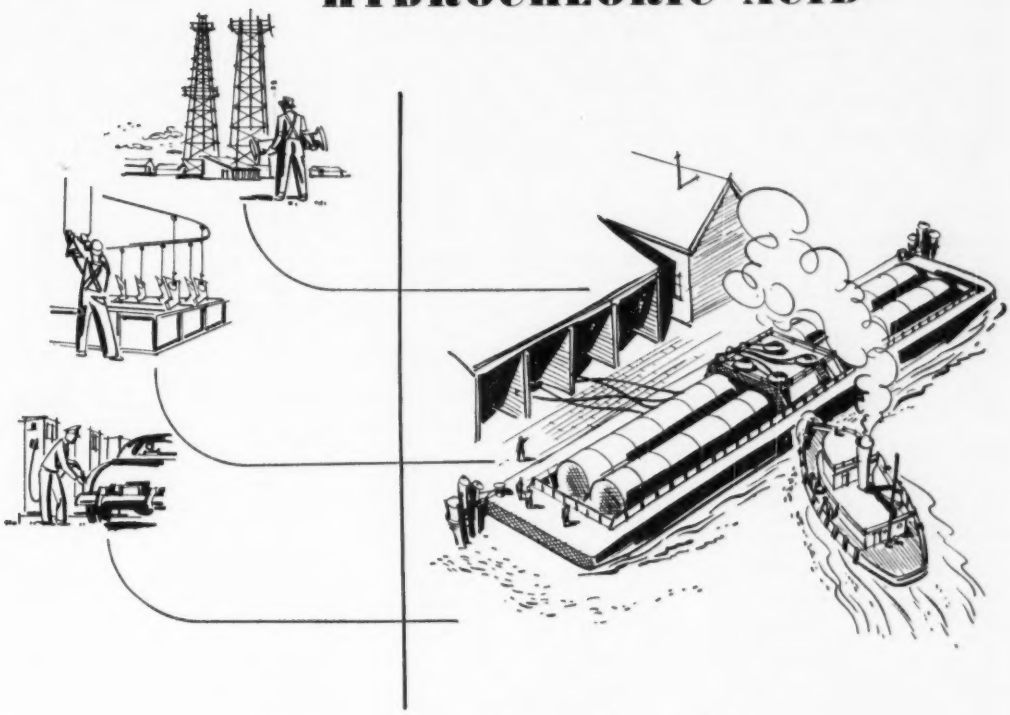
NICKEL DIBUTYL DITHIOCARBAMATE (NBC)

M.W., 467; Sp. G., 1.29; green powder. An inhibitor of static and dynamic exposure-cracking for GR-S synthetic rubber; also improves heat resistance and retards sunlight discoloration of neoprene compositions. Commercially available. E. I. du Pont de Nemours and Co., Inc., Rubber Chemicals Div.

NICKEL SILICATE (META)

$NiSiO_3$. M.W., 134.8; greenish-yellow powder; insol. in water; decomposed by mineral acids.

HYDROCHLORIC ACID



puts corrosion to work

The corrosive properties of hydrochloric acid are actually a boon to modern industry. HCl is widely used for treatment of oil wells to open rock formations, and for descaling of industrial heat exchange equipment. It also serves in the pickling and cleaning of metal products. Hydrochloric acid is used as an intermediate in the manufacture of ethyl chloride, essential to anti-knock fluid for gasoline.

America's stake in Dow hydrochloric acid is a big one! The above barge is one of several, each about 225 thousand gallon capacity, used to transport this acid from Dow's Freeport, Texas plant up the Mississippi and Ohio Rivers to Cincinnati, Ohio.

Look to Dow to satisfy your acid needs. For further information and technical assistance write us at Midland.

THE DOW CHEMICAL COMPANY

MIDLAND, MICHIGAN

DOW ALSO PRODUCES over 600 chemicals including: caustic soda, phenol, aniline, monochlorobenzene, propylene oxide, epsom salt, ethylene oxide, and other basic, industrial, pharmaceutical and agricultural chemicals.

DOW

CHEMICALS

INDISPENSABLE TO INDUSTRY AND AGRICULTURE

Suggested use: Pigment (ceramics). Availability: Laboratory scale. City Chemical Corp.

$NO_2C_6H_4SO_2F$. M.W., 205; B.P., 143°C. (7 mm.); M.P., 45.47°C.; Sp. G., 1.582 @ 55°C.; odor, mild, fragrant; color, yellow; % hydrolysis, water, 29.9 (1 hr. @ 100°C.); thermally stable; much less reactive than corresponding chloride. Availability: small quantities for exptl. investigation. The Pennsylvania Salt Mfg. Co.

m-NITROBENZENESULFONYL FLUORIDE

bis-(3-NITRO-4-CHLOROPHENYL)-SULFONE

$(O_2NClC_6H_3)_2SO_2$. M.W., 377.1; cream colored powder; M.P., 193-198°C. Suggested use: As a dyestuff intermediate and as an intermediate for synthesis. Availability: Research quantities. Monsanto Chemical Co., Merrimac Div.

2-NITRODIPHENYLAMINE

$O_2N\ C_6H_4NH\ C_6H_5$. M.W., 214.22; crystalline solid; color, orange-red; M.P., 74.92°C.; Sp. G., 1.366; insol. in water; limited sol. in paraffinic hydrocarbons; sol. in acetone, benzene, chloroform and dioxane. Chemical properties: The amine group may be alkylated with dimethylsulfate; the nitro group may be readily reduced to an amine group; heating with iron or ferrous oxides yields the tricyclic phenazine; does not readily form salts. Suggested uses: Polymerization stopper for cold rubber, intermediate for dyestuffs and pharmaceuticals. Availability: Semi-commercial quantities. American Cyanamid Co.

2-NITRODIPHENYLAMINE

$NO_2C_6H_4NHC_6H_5$. M. W. 214; purity, 96% min; color, orange; setting point, 73°C. (pure 74.5°C.); sol. in water, very low; sol. in aromatic hydrocarbons and alcohols. Chemical properties: reduction by tin and hydrochloric acid yields 2-aminodiphenylamine; reaction with dimethylsulfate yields N-methyl-2-nitrodiphenylamine; heat in the presence of iron oxide produces phenazine. Calco Chemical Division, American Cyanamid Co.

OCTACHLOROCYCLOPENTENE (C-58)

C_5Cl_8. M.W., 353.7; M.P., 39°C.; B.P., 107°C. @ 1.6 mm.; R.I., 1.5683 @ 45°C.; color, white; odor, camphor-like. Chemical properties: The 4 allylic chlorine atoms and the double bond contribute to its chemical reactivity; oxidation to a debasic acid; hydrolysis in the presence of strong acids; acetal formation with alkoxides. Suggested uses: Wood preservative, moth repellant, non-sulfur vulcanizer for rubber, chemical intermediate, extreme pressure lubricant additive. Availability: Pilot plant quantities. Hooker Electrochemical Co.

OCTACHLORONAPHTHALENE

$C_{10}Cl_8$. M.W., 403.7; chlorine content, 69.8-70.0%; M.P., 191-198°C.; color, white to light tan; free flowing crystalline product. Suggested uses: Insecticide, dye synthesis, filler in electrical insulation. Availability: Small quantities for exptl. purposes. Hooker Electrochemical Co.

OXAMIDE

$(CONH_2)_2$. M.W., 88.07; white powder; melts with decomposition @ 417-419°; sublimed at lower temp.; slightly sol. in water, alcohol, ether; decomposed by strong hot alkali. Availability: Semi-commercial scale. City Chemical Corp.

β,β'-OXYDIPROPIONITRILE

$NCC_2H_4OC_2H_4CN$. M.W., 124.14; colorless liquid; M.P., 26.30°C; B.P., 155°C. (5 mm.); Sp. G., 1.0405 @ 30°C.; R.I., n_D^{30}, 1.4392; viscosity, 8.00 cp. @ 30°C.; surf. tens., 47.5 dynes/cm. @ 30°C.; flash pt. (Tagliabue closed cup), >80°C.; miscible with aromatic materials; almost totally immiscible with aliphatic hydrocarbons; able to selectively extract aromatics from paraffins; thermally unstable above 175°C. Chemical properties: The nitrile groups may be readily hydrated, hydrolyzed, esterified and reduced cleaved by alkali to acrylonitrile and ethylene cyanohydrin. Suggested uses: Solvent and selective solvent, insecticide, intermediate for plasticizers, wetting agents, anti-freeze agents. Availability: Trial lot quantities for exptl. investigation. American Cyanamid Co.

PENTACHLORO ANISOLE

$C_7H_3OCl_5$. A free-flowing powder. M.P., 106.5° C.; decomposes @ 170-180°C.; insol. in water sol. in ethyl alcohol; very sol. in benzene and CCl_4. Available in exptl. quantities. Mathieson Chemical Corp.

1,1,1,3,3-PENTAFLUOROTRICHLORO-PROPANE

$CF_3ClCCl_2CF_2$. M.W., 237.4; Sp. G., 1.6681 @ 20°/4°C.; R.I., 1.3519 @ 20°C.; B.P., 72.0°C.; M.P., —4.3°C.; insol. in water; odor, sweet; color, waterwhite. Suggested uses: As an intermediate for CF_2:CCl—CF_3 and other highly fluorinated chemicals and as a stable solvent. Availability: Research quantities. Halogen Chemicals Inc.

PERFLUORODIMETHYLCYCLOHEXANE

C_8F_{16} (a mixture of perfluoro-1, 3 and 1,4 dimethylcyclohexane isomers); M.W., 400; B.P., 102°C.; Sp. G., 1.853 @ 20°C.; R.I., 1.2858 @ 30°C.; dielec. const., 1.75 @ ,1-100 kc; dielec. strength, 15,000 volts; D.C. resistivity, 1.2×10^{12} ohm-cm. Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C.; resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: Heat transfer medium, electrical insulating fluid, inert reaction fluid, power transmission liquid, thermometric or manometric fluid. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours and Co., Inc., Rubber Chemicals Div.

PERFLUOROMETHYLCYCLOHEXANE

C_7F_{14}. M.W., 350; B.P., 76°C.; Sp. G., 1.7999 @ 20°C.; R.I., 1.2762 @ 30°C.; dielec. const., 1.70 ,1-100 kc; dielec. strength, 16,600 volts; D.C. resistivity, 5.2×10^{12} ohm-cm. Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C.; resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: Heat transfer medium, electrical insulating fluid, inert reaction fluid, power transmission liquid, thermometric or manometric fluid. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours and Co., Inc., Rubber Chemical Div.

1-PHENYL-3-CARBETHOXY-PYRAZOLENE

$C_{12}H_{12}O_2N_2$. M.W., 217; M.P., 178-180°C.; practically white powder. Chemical properties: The active hydrogen in position 4 condenses with phenols and naphthols to form interesting new dyestuffs. Availability: Commercial quantities. Special Chemicals Div. Winthrop-Stearns Inc.

PHENYLHYDRAZINE ACETATE

$C_6H_5N_2CH_3COOH$. Oily yellow to brown liquid; decomposed by water; sol. in organic solvents; decomposes on keeping. Used for preparing derivatives of organic carbonyl groups. Amend Drug & Chem. Co.

PHENYL 2-THIENYL KETONE (Benzoyl thiophene)

$C_6H_5COC_4H_3S$. M.W., 188.1; C.P., 52°C.; yellow or green lumps; sol. in alcohol, acetone, and benzene; insol. in water. Suggested use: As chemical intermediate particularly in pharmaceuticals. Availability: Commercial quantities. Monsanto Chemical Co., Organic Div.

PHOSPHORUS ACID (100% flaked solid)

H_3PO_3. M.W., 82.04; white crystalline flakes; bulk density, 0.85; M. P. 73°C.; decomposes @ 235°C.; Sp. G. of molten acid, 1.594 @ 100°C.; approx. change in sp. g., 0.00076 per °C. from 90-140°C.; elect. conductivity of molten acid, approx. 0.16 mohs. @ 100°C.; R.I. of supercooled liquid, 1.4420 @ 30°C.; water sol. 75.6% @ 0°C. and 87.5% @ 40°C. Is a strong dibasic acid and a strong though slow reducing agent. Ionization const. at 0.05 mols/l. @ 18°C., $K_1 = 5.4 \times 10^{-2}$, $K_2 = 2.1 \times 10^{-7}$ (Kolthoff); oxidation potential of the couple H_3PO_3—H_3PO_4, 0.2 v. in acid sol., and 1.05 v. in alkaline sol. (Latimer). Suggested use: As an acid reducing agent and for prep. of phosphite salts for reducing and antioxidant applications. Availability: Developmental quantities. Monsanto Chemical Co., Phosphate Div.

POTASSIUM CAMPHOSULPHONATE

$C_{10}H_{15}OSO_3K$. White crystalline powder; freely sol. in water. Used medicinally. Amend Drug & Chem. Co.

POTASSIUM SUCCINATE

$(CH_2COOK)_2 \cdot 3H_2O$. M.W., 248; white hygroscopic crystals; sol. in water. Suggested use: Medicinal. Availability: Semi-commercial scale. City Chemical Corp.

POTASSIUM TITANATE

$K_2O \cdot TiO_2 \cdot XH_2O$. White granular material; hygroscopic; sol. in water with hydrolysis; decomposed by acids. Used as reagent. Amend Drug & Chem. Co.

PROPYLAMINE

$CH_3CH_2CH_2NH_2$. M.W., 59.1; Sp. G., 0.715-0.720 @ 20°C.; physical state, water-white liquid; odor, strong amine; distillation: I.B.P., 46°C. (min.); 95% between 46.5-52°C.; F.B.P., 55°C. (max.); purity 98% (min.). Uses: Intermediate for organic synthesis. Availability: Pilot plant quantities. Sharples Chemicals, Inc.

PROPYLENE GLYCOL LAURATE

A deodorized, decolorized propylene glycol laurate ester. Pale straw liquid; practically no odor; M.P., 4-12°C.; iodine No., 2.0 max.; acid no., 2.7 max.; Sp. G., 0.907. Uses: Solvent for cosmetic color; lubricant in lipstick, rouge and cream powder formulations; emollient for cosmetic creams and lotions. Commercially available. Kessler Chemical Co., Inc.

RESORCINOL DIBENZOATE

$C_6H_4(O_2CC_6H_5)_2$. M.W. 318.31; white solid. M.P. 115.5°-119°C.; sol. absolute alcohol; insol. in water. Suggested use: As a light stabilizer for vinyl and cellulose ester resins. Available in laboratory quantities. Heyden Chemical Corp.

RIBOFLAVIN, R. S.

A newly discovered crystalline form of riboflavin; much more sol. in water than other two forms. Conc. of 300 to 400 mg per liter have a high degree of stability. Physiol. activity equal to standard U.S.P. riboflavin and it otherwise meets U.S.P. specifications. Solubility characteristics make this product preferable to less sol. forms. Available commercially. Commercial Solvents Corp.

SILICIC ACID A.R. (100 Mesh)

$SiO_2 \cdot xH_2O$. Fine, white powder; odorless. A new grade of silicic acid. Insol. in water or acids other than hydrofluoric; sol. in hot fixed alkali hydroxide solutions. Proposed use: For chromatographic adsorption. Availability: Commercial quantities. Mallinckrodt Chemical Works.

SILVER OXIDE (Battery Grade)

Ag_2O. M.W., 231.76. Heavy, dark, brownish black powder; odorless; almost insol. in water; sol. in dil. HNO_3 and NH_4OH; high purity. Suggested use: For manufacture of small, rechargeable batteries. Availability: Commercial quantities. Mallinckrodt Chemical Works.

SODIUM ASPARAGINATE

$NaC_4H_7N_2O_3$. White granular material; hygroscopic; sol. in water. Used medicinally for a diuretic effect and in preparation of bacterial media. Amend Drug & Chem. Co.

SODIUM DISPERSIONS

These are stable dispersions of metallic sodium in inert media with lower B.P.'s than the M.P. of sodium (97.5°C.). They contain up to 50% by weight of sodium in particle sizes ranging from submicron to 20 microns. In this form, sodium has these advantages: increased reactivity, stepped-up reaction rates at lower temperatures, higher yields, less side reactions plus the fact that sodium dispersions are easily handled in pipes at room temperatures. Manufacturer does not supply the dispersions but rather the techniques for preparation, use and handling. Samples in such media as toluene, xylene, naphtha, kerosene, etc., are offered, however, for experimental use, along with complete technical assistance. National Distillers Chemical Corp.

SODIUM ETHYL SULPHATE

$NaC_2H_5O_4S$. Pearly crystalline flakes; very sol. in water; sol. in warm alcohol. Used as reagent. Amend Drug & Chem. Co.

SODIUM ETHYLATE

$NaOC_2H_5$. A free-flowing white powder; sol. in ethyl alcohol. Suggested uses: Pharmaceutical manufacture and other synthetic organic preparations. Available in exptl. quantities. Mathieson Chemical Corp.

SODIUM GLYCINATE

$NH_2CH_2CO_2Na$. White to pale yellow granules; extremely hygroscopic; freely sol. in water. Used medicinally. Amend Drug & Chem. Co.

SOLVATED SODIUM METHYLATE

$NaOCH_3 \cdot CH_3OH$. A free-flowing white powder; sol. in methyl and ethyl alcohol. Possesses greater stability to contact with moisture and oxygen than anhyd. sodium methylate; also less heat of reaction when dissolved. Suggested uses: Pharmaceutical manufacture and other synthetic organic preparations. Available in exptl. quantities. Mathieson Chemical Corp.

STEARYL DIMETHYL ETHYL AMMONIUM BROMIDE

Tech. grade; approx. 75% active in isopropanol; a white paste. Availability: Semi-commercial. Onyx Oil & Chemical Co.

STRONTIUM PHOSPHATE, DIBASIC (Std. Luminescent)

$SrHPO_4$. M.W., 183.62; fine, white, crystalline powder; odorless; insol. in water; sol. in dil. acids; unusually high purity. Suggested use: Manufacture of halophosphate phosphors and other phosphors. Availability: Commercial quantities. Mallinckrodt Chemical Works.

STRONTIUM THIOCYANATE

$Sr(CNS)_2 \cdot 3H_2O$. M.W., 257.83; white, deli-

quescent crystals; sol. in water. Availability: Semi-commercial scale. City Chemical Corp.

TETRAETHOXY PROPANE
(Source of Malonic Aldehyde)

$(C_2H_5O)_2CHCH_2CH(OC_2H_5)_2$. M.W., 220.3; B.P., 109°C. @ 20 mm.; Sp. G., 0.924 @ 20/20°C.; insol. in water. Chemical properties: Hydrolyzes readily in acid soln. to yield malonic aldehyde; reacts as maonic aldehyde in its enol form in many organic syntheses such as condens. with amines and other active hydrogens. Uses: Chemical and pharmaceutical syntheses particularly in production of 2-amino pyrimidine for synthesis of sulfadiazine and antihistiminics. Available in pilot-plant quantities. Carbide and Carbon Chemicals Div.

TETRAETHYLENE GLYCOL DIBENZOATE

$C_6H_5COO(CH_2CH_2O)_4OOCC_6H_5$. M.W., 402; Sp. G., 1.160 @ 25°C.; R.I., 1.524 @ 30°C.; flash pt., 490°F.; fire pt., 530°F.; visc. @ 100°F., 40.3 centistokes; B.P., approx. 290°C. @ 2 mm.; sol. in water, approx. 0.005% @ 25° C.; miscible with organic solvents; odor, none; color, water white. Chemical properties: Can be saponified at elevated temp. Availability: Laboratory quantities. Hooker Electrochemical Co.

1,2,5,6-TETRAHYDROBENZALDEHYDE
(1-Formyl cyclohexene-3)

$C_7H_{10}O$. M.W., 110; B.P., 68°C. @ 3 mm.; Sp. G., 0.968 @ 20/20°C. Chemical properties: Undergoes normal reactions of aldehydes incl. condensation with amines and active metylene groups. Halogenates readily on double bond, can be hydrogenated to yield hydroxymethyl cyclohexane. Uses: Intermediate for snythesis of odorants, rubber chemicals. Available in research quantities for exptl. use. Carbide and Carbon Chemicals Div.

β,β'-THIODIPROPIONITRILE

$NCC_2H_4SC_2H_4CN$. M.W., 140.20; white crystalline solid; M.P., α phase 28.65°C., β phase 22.10°C.; Sp. G., 1.1095 @ 30°C.; R.I. n_D^{30}, 1.5022; viscosity, 20.55 cps. @ 30°C.; surf. tens., 51.9 dynes/cm. @ 30°C.; flash pt. (Tagliabue closed cup), >80°C.; sol. in water, 1% @ 25°C., 10% @ 96°C.; sol. in ethanol, acetone, chloroform and benzene; insol. in aliphatic hydrocarbons; able to selectively extract aromatics from paraffins; thermally unstable above 175°C. Chemical properties: The nitrile groups may be readily hydrated, hydrolyzed, and esterified; may be oxidized to the sulfoxide and sulfone. Suggested uses: Solvent and selective solvent, intermediate for food preservatives, plasticizers, wetting agents, insecticides. Availability: Trial-lot quantities for exptl. investigation. American Cyanamid Co.

2-THIOPHENECARBOXALDEHYDE
(Thiophene-2-aldehyde)

C_4H_3SCHO. M.W., 112.1; C.P., about −6 to −8°C.; B.P., 90-95°C. @ 25 mm.; Sp. G., 1.2 @ 25°C.; R.I., 1.585 @ 25°C.; colorless liquid, darkens on standing; miscible in benzene and alcohol; immiscible in water. Suggested use: As chemical intermediate in pharmaceutical and other fields. Availability: Commercial quantities. Monsanto Chemical Co., Organic Div.

TIN (ic) PHOSPHATE

$SnO_2P_2O_5 \cdot 1OH_2O$. Heavy white powder; insol. in water. Used as abrasive, pigment and reagent. Amend Drug & Chem. Co.

1,2,3-TRICHLOROBENZENE

$C_6H_3Cl_3$. M.W., 181.5; M.P., 52.53°C.; B.P., 218-219°C.; color, white crystalline; odor, typical of chlorinated benzenes. Chemical properties: Will undergo the usual reactions of a benzoid ring and also of aromatic Cl-atoms; can be nitrated, sulfonated and brominated; Cl-atoms can react with alkoxides to produce ethers; one of the Cl-atoms can be converted to a phenol group by the use of caustic. Suggested uses: A high dielectric constant component in electrical fluids, dye intermediate. Availability: Laboratory samples. Hooker Electrochemical Co.

1,3,5-TRICHLOROBENZENE

$C_6H_3Cl_3$. M.W., 181.46; B.P., 208°C. @ 740 mm.; M. P., 62.7°-63.0°C; sol in hot methanol, insoluble cold; characteristic trichlorobenzene odor; white needle-like crystals. Suggested uses: As a dye or plastic intermediate. Availability: Small quantities for exptl. investigations. Hooker Electrochemical Co.

TRIETHYLENE GLYCOL DIBENZOATE

$C_6H_5COO(CH_2CH_2O)_3OOCC_6H_5$. M.W., 358; Sp. G., 1.166 @ 25°C.; R.I., 1.532 @ 30°C.; flash pt., 470°F.; fire pt., 520°F.; visc. @ 100°F., 33.56 centistokes; B.P., approx. 225°C @ 1½ mm.; sol. in water, 0.0025% @ 25°C.; miscible with organic solvents; odor, none; color, water white. Chemical properties: Can be saponified at elevated temp. Suggested uses: Plasticizers, dielectrics. Availability: Pilot plant scale. Hooker Electrochemical Co.

1,3-bis(TRIFLUOROMETHYL)BENZENE

$C_6H_4(CF_3)_2$. M.W., 214.11; B.P., 115°C; Sp.G., 1.395 @ 20°C/15.5°C; odor, aromatic and sweet; color, water white liquid. The trifluoromethyl groups are stable to common methods of hydrolysis. Although the ring hydrogens are quite resistant to the most usual means for ring substs., it will undergo nitration in the 5 posit. which can, in turn, be reduced to the corresp. amino deriv. Uses: As a dye intermediate or selective solvent. Availability: Research quantities. Hooker Electrochemical Co.

m-(TRIFLUOROMETHYL)BENZYL CHLORIDE

$CF_3C_6H_4CH_2Cl$. M.W., 194.5; Sp.G., 1.310 @ 25°C; R.I., 1.4612 @ 25°C; B.P., 184-186°C @ 760 mm. or 73°C @ 17 mm.; odor, characteristic of benzyl chloride;; color, water white liquid. The chlorine is active and will undergo reactions typical of benzyl chloride. Is adaptable to the synthesis of compounds in which a trifluoromethyl benzyl group is desired. Suggested uses: Dye synthesis and pharmaceuticals. Availability: Laboratory samples. Hooker Electrochemical Co.

m-(TRIFLUOROMETHYL)PHENYL ISOCYANATE

$CF_3C_6H_3NCO$. M.W., 187; Sp.G., 1.434 @ 25°C/25°C; R.I., 1.6670 @ 20°C; B.P., 169.5-171°C (760 mm.); L. C. P., −20°C; odor, pungent; color, water white. Chemical properties: Typical reactions of phenyl isocyanate, such as the formation of substituted ureas, carbonyl chlorides, ureathanes, carbamates, etc., as applicable to trifluoromethyl phenyl isocyanate. The tri-fluor-methyl group is not attacked by common methods of hydrolysis and is strongly meta directing. Suggested uses: Application in the manufacture of resins, textile finishing agents, herbicides and other typs of products useful as dye and pharmaceutical intermediates. Availability: Laboratory samples. Hooker Electrochemical Co.

1,1,3-TRIFLUOROPENTACHLOROPROPANE

$CFCl_2\text{-}CCl_2\text{-}CF_2Cl$. M.W., 270.3; Sp.G., 1.7702 @ 20°/4°C.; R.I., 1.4396 @ 20°C.; B.P., 152.3°C.; M. P., −4.9°C.; insol. in water; odor, camphoraceous; color, waterwhite. Suggested uses: As an intermediate for the preparation of highly fluorinated cpds. Availability: Research quantities. Halogen Chemicals Inc.

TRIMETHYL ORTHOFORMATE

$HC(OCH_3)_3$. M.W., 106.12.; purity, 98.0% min.; B.P., 103-105°C.; Sp.G., 0.9706 @ 20/20°C.; R.I., 1.3780 @ 20°/D.; colorless liquid. Chemical properties: An ester closely resembling an acetal; stable in the presence of alkali; unstable in the presence of acid. Source for the methoxymethylene group. Suggested uses: For the synthesis of photographic chemicals and dyes; as a substitute for triethyl orthoformate in the synthesis of Vitamin B_1; antimalarials; useful polymerization products; polymethine dyes; acetals. Availability: Semi commercial quantities. American-British Chemical Supplies, Inc., Kay-Fries Chemicals, Inc.

TRIPHENYL PHOSPHINE

$(C_6H_5)_3P$. M.W. 262. The pure material crystallizes in plates or prisms from Et_2O; M.P., 79°C; B.P., 188°C @ 1 mm; R.I., 1.5247 @ 69°C; Sp.G., 1.0749 @ 80°/4°C. Available material is a white to light yellow triboluminescent solid; M.P., 72°-75°C; approx. 95% pure; very sol. in Et_2O; sol. in $CHCl_3$, AcOH, and C_6H_6; insol. in H_2O. Suggested uses: In the synthesis of dyes, pharmaceuticals, insecticides, and mothproofing cpds. Availability: Small quantities for exptl. investigation. Hooker Electrochemical Co.

TRIPOTASSIUM HYDROGEN PYROPHOSPHATE

$K_3HP_2O_7$. M.W., 292. M.P., decomposes around 325-350°C. Sp.G. 2.38 @ 27°C., white crystalline deliquescent solid, sol. in water, greater than 70 g. in 100 ml. water; pH of a 1% solution, 6.9-7.3. Suggested uses: In electroplating baths or wherever a neutral complexing agent is indicated. Availability: Semi-commercial quantities. Victor Chemical Works.

TRIPROPYLAMINE

$(CH_3CH_2CH_2)_3N$ M.W., 143.3; physical state, waterwhite liquid; Sp.G., 0.758 @ 20°; Boiling range, 150-158°C. Use: Intermediate for organic synthesis. Availability: Laboratory quantities. Sharples Chemicals, Inc.

URANIUM POTASSIUM SULFATE (URANYL)

$UO_2SO_4.K_2SO_4.2H_2O$. M.W., 576.5; yellow crystals; becomes anhydrous at 120°C. sol. in water. Availability: Laboratory scale. City Chemical Corp.

VERATROLE
(o-Dimethoxybenzene)

$(CH_3O)_2C_6H_4$. M.W., 138.2; M.P., 22.5°C.; B.P., 207°C.; Sp.G., 1.09@ 15°/15°C.; colorless to pale yellow liquid; sol. in most organic solvents; very slightly sol. in water. Suggested use: As intermediate in chemical syntheses and as solvent. Availability: Commercial quantities. Monsanto Chemical Co., Organic Div.

VINYL BENZOATE

$C_6H_5COOCH{:}CH_2$. M.W., 148; Sp.G., 1.065 @ 20°C; B.P., 203°C @ 760 mm.; odor sweet; color, water white. Chemical properties: Polymerizes to a hard, transparent resin. Suggested uses: For use as a copolymer with vinyl acetate, acrylic, resins, and other monomers to improve hardness, surface gloss, electrical properties, and water resistance of lacquers and surface coating compositions, and to improve the water resistance of adhesives. Availability: Laboratory quantities. Hooker Electrochemical Co.

ZINC FORMATE
(Anhydr.)

$Zn(CHO_2)_2$. White crystalline powder; sol. in hot water. Used as reagent. Amend Drug & Chem. Co.

SPECIALTIES

ACCELERATOR 52-9

Extruded tetramethylthiuramdisulfide. A free-flowing, dustless accelerator with improved dispersibility. Use: Accelerator for rubber vulcanization. Available in commercial quantities. Sharples Chemicals, Inc.

ACCELERATOR 57-9

Extruded form of zinc dimethyldithiocarbamate. A free-flowing, dustless accelerator with improved dispersibility. Use: Accelerator for rubber vulcanization. Available in commercial quantities. Sharples Chemicals, Inc.

ACETAMINE® FAST YELLOW 4RL

New dye for acetate and nylon; exceptionally good fastness to light. Is of particular interest for the coloring of fabrics for draperies, furniture coverings, sportswear, dress goods, etc.; also valuable as a shading element for increasing the light fastness in various acetate color combinations; tinctorially strong and produces reddish-yellow shades; the shades obtained on nylon are noticeably redder than those on acetate rayon. Dyeings on the two fibers are comparable with regard to fastness, and show very good resistance to crocking, hot moist pressing, dry cleaning and gas-fume fading. It is a finely dispersed, direct dyeing color that is absorbed readily and yields dyeings that are evenly penetrated, non-specky and full in color value; exhibits good discharge properties on the two fibers as well. It stains cotton and viscose rayon considerably and dyes silk and wool redder than acetate. E. I. du Pont de Nemours & Co., Organic Chem. Dept. * Trademark.

ACRYLOID B-72, 100% SOLIDS

A polymerized acrylic ester type resin in granular solid form. Used in a variety of solvents to produce enamels, luminescent coatings, and transparent, colorless films resistant to heat, water, alkali, acid, oils, and chemical fumes. Availability: Plant-scale. Rohm & Haas Co., The Resinous Products Div.

ADHESIVE, RESIN EMULSION #2031

An emulsion compounded of vinyl polymers, solvents and plasticizing agents. Color, white, drying to clear film; pH 4; non-residual solvent odor. Properties: Adheres to wax-coated boards for frozen food container manufacture; Bond is water resistant, meeting 4-12 hr. immersion in 70° water, dependent on job reqts. Suggested uses: For high speed roller application, folding box manufacture, carton sealing machines. Commercially available. Paisley Products, Inc.

ADHESIVE, RESIN EMULSION #4199

An emulsion compounded of vinyl polymers, tackifiers and plasticizing agents. Color, white; pH 5; weight per gal., 9½ lbs. High degree of initial tack enables fast bonding of wide range of paperboard stocks. Suggested uses: Fast carton formers and sealers. Commercially available. Paisley Products, Inc.

ADIPYL DIHYDRAZIDE-FORMALDEHYDE POLYMER

A white resin; M.P. 155-160° C.; decomposition temp. over 250° C. Suggested uses: Textile finishing, leather finishing, coating and other synthetic resin applications. Available in exptl. quantities. Mathieson Chemical Corp.

"AKROFLEX" F

A mixture of phenyl beta-naphthylamine, diphenyl paraphenylene diamine, booster and anti-dusting agent; Sp.G., 1.16; dark gray powder. An anti-flex-cracking antioxidant for natural rubber or GR-S compositions. Commercially available. E. I. du Pont de Nemours and Co., Inc., Rubber Chemicals Div.

AGRIMUL® 30

A 100% active blend of nonionic and anionic chemicals; used specifically as an emulsifier for such chlorinated hydrocarbons (insecticides) as toxaphene, chlordane and benzene hexachloride. Color, amber fluid; sol., 10% solution clear @ 25° C. with a pH of 7.0-7.5. Exhibits outstanding anticorrosion qualities when used with highly chlorinated products. Commercially available. Nopco Chemical Co.
* Trademark

ALLETHRIN

A synthetic chemical similar in nature to Cinerin I, one of the insecticidal principles in pyrethrum flowers. Sp.G., 1.005-1.015 @ 20/20° C.; R.I., 1.5010-1.5035 @ 30° C.; acidity, less than 3% determined as chrysanthemum monocarboxylic acid; color, clear, brownish; odor, mild and unobjectionable; LD_{50} for rats, 0.92 g./kg.; low order of toxicity by skin penetration. Uses: Is similar in insecticidal properties to pyrethrins but for individual kinds of insects may be more or less effective; has better stability to UV light than pyrethrins. Available in commercial quantities. Carbide and Carbon Chemicals Div.

ALPHAMINE RED R (Herstein)

(β-Naphthylamine-3, 6 disulfonic-acid-azo-N-phenyl-a-naphthylamine ammonium salt) Dark red powder; sol. in water. Used as indicator in chromatography of organic acids. Amend Drug & Chem. Co.

ALRODYNE 255

A nonionic fatty polymeric emulsifier; M.W., 2550; solidification temp., −15° C.; dispersible in water, sol. in aromatic hydrocarbons; less hydrophilic than Alrodyne 315. Not affected by hard water; non-foaming; non-corrosive; non-injurious to plants or animals but toxic to pea aphids. Suggested uses: Emulsifier for DDT, 2,4-D esters, other agricultural spray chemicals. Available in commercial quantities. Alrose Chemical Co.

ALRODYNE 315

A nonionic fatty polymeric emulsifier; M.W., 3150; solidification temp., 7° C.; sol. in water and aromatic hydrocarbons. Not affected by hard water; non-foaming; non-corrosive; non-injurious to plants or animals but toxic to pea aphids. Suggested uses: Emulsifier for chlordane, methoxychlor, lindane, benzenehexachloride, toxaphene. Available in commercial quantities. Alrose Chemical Co.

ALROLENE 65

A solvent sol. detergent primarily for use in chlorinated solvents for dry cleaning; also for metal degreasing, formulation of spotting cmpds., water-in-oil emulsions, corrosion inhibitors; dispersant. Available in commercial quantities. Alrose Chemical Co.

ALROLENE 70

A solvent sol. detergent primarily for use in aliphatic hydrocarbon and petroleum solvents for dry cleaning; also suitable for spotting cmpds., lubricant additive, metal degreasing, water-in-oil emulsions; corrosion inhibitor; dispersant in non-aq. media. Available in commercial quantities. Alrose Chemical Co.

ALROSEPT MBC-50

A quaternary ammonium germicide available as a 50% sol. of tridecyl benzyl hydroxyethyl imidazolinium chloride. Phenol coefficient (100% basis): 350 vs. E. typhosa; germicidal at pH 3-10. Applications: Restaurant and tavern sanitation; germicide and fabric softener in laundries; diaper odor inhibitor; disinfection of poultry drinking water; dairy, farm and food plant sanitation; algae and slime control. Available in commercial quantities. Alrose Chemical Co.

ALROSPERSE 40K

Alkyl naphthalene sulfonate, dispersing agent 40% active, neutral aq. solution, miscible with water and dispersible or partly sol. in most organic solvents incl. kerosene and mineral oil. At conc. of 0.1% or less, produces stable suspensions of carbon black, metal oxides, clays and pigments, without appreciable effect on viscosity, differing in this respect from the polyphosphates and condensed naphthalene sulfonates; also possesses good wetting, rewetting and emulsifying properties. Applications: Dispersing agent and pigment grinding aid; emulsion paints; textile wetting and rewetting agents; polishing and buffing compounds; cutting oil formulation; dust laying in mining; coal loading. Available in commercial quantities. Alrose Chemical Co.

ALIZARINE CYANONE GREEN GN EXTRA

Alizarine Cyanone Green GN Extra possesses excellent solubility. Since it draws exceptionally well in a neutral bath, it is well adapted for dyeing unions containing wool or silk. Cotton and acetate rayon are slightly stained, but viscose rayon is left clear. It is also suitable for coloring pure silk, tin-weighted silk, nylon or leather. It possesses excellent fastness to carbonizing, acid spotting, water and water spotting, very good fastness to rubbing, steaming, hot pressing and light and good fastness to washing, light fulling, perspiration, alkalies and chlorine. National Aniline Division, Allied Chemical & Dye Corp.

ALIZAROL ORANGE ML

Alizarol Orange ML is well suited for coloring loose wool (dyeing particularly well on tippy wool), slubbing, yarn and piece goods. It is easily soluble, works exceptionally well and can be applied by either Top Chrome, Metachrome or Bottom Chrome methods. It also is well adapted for Vigoureux printing. It possesses very good fastness to washing, fulling and rubbing and excellent fastness to perspiration, potting, carbonizing, alkalies, stoving, water, sea water, steaming and light. National Aniline Division, Allied Chemical & Dye Corp.

ALIZARINE SAPPHIRE EMM

Alizarine Sapphire EMM is a non-dusting acid dye of the Anthraquinone group. It levels well on wool producing somewhat greenish blue shades of very good fastness to salt water spotting. In addition it possesses good fastness to alkali and light and very good fastness to salt water bleeding, fresh water spotting or bleeding and acid perspiraion and excellent fastness to carbonizing, rubbing, steaming and stoving. National Aniline Division, Allied Chemical & Dye Corp.

ALROWET CA

Bis (alkyl phenol) polymethylene sulfonate, 65% active. Forms colloidal sols. at neutral and acid pH with good wetting, foaming and dispersing properties. Unlike other anionics, it is not adsorbed by cellulose and other surfaces at acid pH. In alkaline soln., it possesses no surface-activity due to ionization of the phenolic groups; colloidal properties are restored on reducing pH below 9. Available in pilot plant quantities. Alrose Chemical Co.

AMBERLITE IR-45

A weakly basic anion exchange resin shipped in the free-base form. Density, .36 lbs./ft.³ (backwashed and drained); moist. content, 40 to 50%; screen grading (wet), 20 to 50 mesh; effect. size, 0.40 to 0.55 mm.; uniformity coeff., 1.8 max.; total exchange cap., 38 kilograins (as calcium carbonate) per ft.³ Stability at elevated temp., excellent; resistance to chem. and phys. attrition, excellent; regeneration efficiency, extr. high. Used to remove acids (except weakly ionized ones) from solutions; in conjunction with a cation exchange resin in Monobed operation, to deionize solutions. Availability: Plant scale. Rohm & Haas Co., The Resinous Products Div.

AMBERLITE IRA-410

A strongly basic, amine-type anion exchange resin, shipped in the chloride salt form as uniform granules. Density, 42 lbs./ft.³ (backwashed and drained); moist. content, 35 to 45%; screen grading (wet), 20 to 50 mesh (U. S. Std. Screens); effect. size, 0.40 to 0.60 mm.; uniformity coeff., 2.0 max.; total exchange cap., 25 kilograins (as calcium carbonate) per ft.³; resistance to acids, bases, oxidizing and reducing agents, and organic solvents, excellent; stability at elevated temp., good. Used to remove weakly ionized acids from aq. solutions, to exchange anions at a neutral pH, and, in Monobed deionization operations, to remove all anions including silica and CO_2. Availability: Plant scale. Rohm & Haas Co., The Resinous Products Div.

AMBERLITE MB-2

A physical mixture of Amberlite IR-120 (a strongly acidic cation exchange resin) and Amberlite IRA-410 (a strongly basic anion exchange resin). Used to produce deionized water, free of silica and CO_2, and characterized by elect. resistance of 18 million ohms per cm. Used industrially to produce high-quality water for electroplating, for deposition of television phosphors, and for high press. boiler feed. Availability: Plant-scale, as sep. components. Rohm & Haas Co., The Resinous Products Div.

AMBERLITE MB-3

A physical mixture of Amberlite IR-120 (a strongly acidic cation exchange resin) and Amberlite IRA-410 (a strongly basic anion exchange resin), dyed with an indicator which changes color as the deionizing cap. of the resin mixture is exhausted. Used to produce deionized water for storage batteries, steam irons, chemical tests, etc. Availability: Plant-scale. Rohm & Haas Co., The Resinous Products Div.

AMIDE PES

A stearic acid amide of a higher mole. wt. polyethylene polyamine. It is a brown, waxy solid which softens at approx. 75°C. and which can be dispersed in hot water. This material has been used effectively as an antistatic agent in the treatment of dynel staple fiber and fabrics. Static electricity on yarns or piece goods is minimized by immersion for 10 min. @ 150°F. in a bath containing 2% Amide PES on the weight of the goods. This is followed by immersion for 5 min. @ 120°F. in a bath containing 1% "Tergitol"* wetting agent 7, to fix the Amide PES. Available in pilot-plant quantities. Carbide and Carbon Chemicals Div.
* Trademark

ANTHRAQUINONE BLUE 4GL

This acid dye for wool offers the generally good characteristics of other anthraquinone blues. It yields bright, greenish-blue shades that possess good fastness to light, dry cleaning, steaming, perspiration and very good resistance to crocking, hot moist pressing and cold water spotting. It has excellent sol. and exhibits very good absorption when applied by the customary methods using either acetic or sulfuric acid. Recommended for dyeing of women's wear, blankets, knitting yarns for sweaters and other uses where bright greenish-blue shades are desirable; also for dyeing nylon; ideal for producing white effects in materials containing effect threads of acetate, cotton or viscose-process rayon. Silk, however, is stained noticeably. E. I. du Pont de Nemours & Co., Organic Chemical Dept.

ARC 1071-33D MASTIC ADHESIVE

Water-resistant, quick-grab mastic for hard surface floor coverings. For adhering vinyl, asphalt, rubber tiles and linoleum to plain, painted, waxed or shellaced wood, concrete, linoleum, steel, or terrazzo. Synthetic resin-rubber emulsion base with good durability. Available only to adhesive manufacturers and distributors. American Resinous Chemicals Corp.

ARCCO 539-10A ADHESIVE

Synthetic resin-rubber emulsion, capable of bonding to painted, enameled, lacquered, waxed, and other difficult surfaces. Used for laminating paper, metal foils, fabric and leather to themselves or to glass, metal, asphalt, cork, wood, and plastics. Water-resistant, odorless, practically colorless film, quick grab. Available to adhesive manufacturers and distributors. American Resinous Chemicals Corp.

ARCCO 1013-41B ADHESIVE-TACKIFIER

Resin emulsion recommended for use with GR-S latices to formulate low-cost combining adhesives for fabric and treated papers. Excellent aging; improved bond strength. Product contains scientific blend of non-staining antioxidants to protect the rubber content. American Resinous Chemicals Corp.

ARCCO 1013-21C FOIL-PAPER LAMINANT

Emulsion-type adhesive for laminating aluminum foils to paper. Produces tear bond. Particularly useful where heat resistance is required. Excellent ageing characteristics. American Resinous Chemicals Corp.

ARCCO 899-21A AND 899-21B METAL CONDITIONER

Etches and prime-coats all metals including galvanized iron, copper, brass, magnesium, aluminum. Dries sufficiently in 15 to 20 minutes to accept practically any conventional top coat. Outstanding corrosion resistance particularly when used with vinyl top coats. American Resinous Chemicals Corp.

ARCCO 764-24H PLASTISOL

Low viscosity suitable for dipping and slush molding applications. Contains no fillers. When fused, deposits a tough, tack-free, flexible, abrasion and chemical-resistant, rubberlike coating. Available clear and pigmented to specifications. 100% solids. American Resinous Chemicals Corp.

ARCCO 716-30 AND 716-35 TACKIFIERS

Resin emulsions for compounding natural and

VINOSOL 771-39B

Vinyl dispersion, containing no fillers, suitable

There's profit here...
if you play your cards right

YOU'RE looking at a winning hand. One that can win profits for you . . . if you play your cards right when you buy soda ash.

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CARBOSE (Sodium CMC) • ETHYLENE DICHLORIDE
PROPYLENE DICHLORIDE
AROMATIC SULFONIC ACID DERIVATIVES
OTHER ORGANIC AND INORGANIC CHEMICALS

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neoprene rubber latex adhesives. Improve tensile and bond strength, specific adhesion, and tack. Suitable for making "wet" or "dry" stick adhesives, for leather, paper, fabric and plastic films. American Resinous Chemicals Corp.

AROFLAT 3010-M65

Pure alkyd for use in flat wall and ceiling paints; brushing ease; non-penetrating; durability; color retention; washability; excellent leveling; compatible with oils; good pigment wetting and suspension; Non-volatile, 64-66%; solvent, mineral spirits; viscosity (G.H.), V-Y @ 65, C-D @ 50; acid value (non-vol.), 4-8; color (Gardner Stds. '33), 9-11; 7.7-7.8 lbs. sol'n. per gal. Commercially available. U. S. Industrial Chemicals, Inc.

AROFLAT 3025-P40

Pure alkyd for use in interior decorative paints; oxidizing; good color retention; brush or spray application; air dries; acid value of non-volatile: 5-10; color (Gardner Std. '33), 6-8; viscosity (G.H.), J-P (2.5-4 poises); non-volatile, 39-41%; solvent, petroleum thinner; 7,2-7.3 lbs./gal. Max. non-penetration properties; hard drying, yet flexible. U. S. Industrial Chemicals, Inc.

AROPLAZ X-663-X

Alkyd; 50% solids in xylol; has non-lifting properties under lacquer without addition of dispersion resin. % non-volatile, 49-51% in xylol; viscosity, X-Z; acid value, 26-32; color (Gardner Stds. '33), 7-11; % oil (based on N.V.), 32%, % phthalic anhyd. (based on N.V.), 39%; 8.3-8.4 lbs./gal. U. S. Industrial Chemicals, Inc.

ARWAX 1043-4B HOT MELT

Deposits a water vapor and water-resistant, tough, non-blocking coating. Derived from S-Polymer, polyethylene, paraffin and microcrystalline wax. American Resinous Chemicals Corp.

BECKAMINE P-630 WET-STRENGTH RESIN

A cationic urea-formaldehyde resin solution which is readily absorbed on the paper fibers. Can be added anywhere on wet end of paper machine as well as size press. Converts at pH's from 4.5 to 6.0. Alum, acids or mixtures may be used to obtain this pH. Used in all types of paper in amounts as low as 0.5%. Commercially available. Reichhold Chemicals, Inc.

BOERITE* R

A sulfonated (sulfated) rice bran fatty acid. Appearance, light red-brown fluid; clear when warm but hazes on standing; 10% aq. emulsions are opalescent; moisture, 30.0%; alkali (as KOH), 1.2 to 1.6%; free fatty acid, 40 to 50%; organically combined SO_3, 5.0 to 6.0%; pH (5% emulsion), 5.5 to 6.0. Suggested for application in paints, ceramics, pigments, detergents and adhesives. Commercially available. Nopco Chemical Co.
* Reg. U. S. Pat. Off.

BRILLIANT ACID BLUE 3B

Brilliant Acid Blue 3B is a new, level dyeing acid blue of which the outstanding characteristics are its high tintorial strength and its brilliancy of shade. It affords the dyer of woolen piece goods a means of producing full, bright blue shades at moderate cost. It possesses fair fastness to light and carbonizing; very good fastness to steaming and sea water bleeding and excellent fastness to crocking, organic acid, ammonia, cold water and sea water spotting. It possesses good affinity for pure silk and for nylon but leaves cotton, rayon and acetate rayon effects practically unstained. National Aniline Division, Allied Chemical & Dye Corp.

CARBOSE LS

A tech. grade, low-viscosity sodium carboxymethylcellulose. Viscosity of 2% sol., 20-50 cps.; pH of 0.5% sol., 6-8. Suggested uses: Designed specifically as a starch replacement in home and commercial laundries. Commercially available. Wyandotte Chemicals Corp.

CARBOSE M

A tech. grade, low-viscosity sodium carboxymethylcellulose. Viscosity of 2% soln., 20-50 cps.; pH of 0.25% soln., 9-10. Suggested uses: Designed specifically for use in well-drilling muds where it acts to reduce fluid loss. Commercially available. Wyandotte Chemicals Corp.

CARBOSE TP

A tech. grade, low-viscosity sodium carboxymethylcellulose. Viscosity of 2% soln., 90-125 cps.; pH of 0.25% soln., 9-10. Suggested uses: Designed specifically for use in textile printing pastes where it acts as a thickener and carrier. Commercially available. Wyandotte Chemicals Corp.

"CARBOWAX"* COMPOUND PF-45

Water-sol., modified polyethylene glycol now available as a 50% aq. soln. Sp. G. of the solution, 1.10 @ 25°C.; viscosity @ 20°C., 8,000-20,000 centistokes; sol. in aromatic hydrocarbons, dioxane, methanol and ethanol, slightly sol. in Cellosolve* solvent and acetone but insol. in aliphatic hydrocarbons and ethers; partly compat. with starch, dextrins, polyvinyl alcohols, and Cellosize* hydroxyethyl cellulose WS but incompat. with paraffin and carnauba wax; compat. with gelatin except in mixtures containing between 40 and 60% of either cpd.; excellent adhesion to glass, metal, and textile fiber surfaces when applied and dried at temp. above 60°C.; extreme toughness and resilience as well as flexibility. Suggested Uses: Cotton warp size (binder and lubricant); for trial in warp size formulas; as a binder; as a thickener; lubricant in calendering coated paper stock. Available in commercial quantities. Carbide and Carbon Chemicals Div.
* Trademark

CARBOXYMETHYL HYDROXYETHYL CELLULOSE

A new water-sol. cellulose mixed ether, not very sensitive to presence of alkaline earth ions in its solutions, producing clear, non-granular films. Density, 1.58 gm./cc @ 25°C; white, tasteless, odorless, fibrous solid. sol. in cold or boiling water, brines, acidified waters to pH 2, also in water to pH 12. Not ppt. by Ca, Ba, Zn ions; some forms are insensitive to Al ions, tolerates silicate, borate, chromate and phosphate ions in soln. Solns. stable to autoclaving, resist growth of micro-organisms. Films from it are bright and clear, and can be plasticized with glycerol, glycols and other common humectants. Material is effective as a detergent aid, reducing redeposition of soil, especially in hard waters or with highly soiled cottons. Useful with anionic or non-ionic detergents, in adhesives, in thickening urea and resorcinol glues for plywood and in thickening various types of latex or polymer emulsions, as a gelatin modifier, as a mold release agent, as a textile size and as a water-soluble coating of good transparency. Made in viscosity grades 50 to 200 cps. at 2% conc. in water, also at 500-1500 cps. Available commercially. Hercules Powder Co.

CASE SEALING GLUE #3950

White color starch and dextrine base adhesive. Weight per gal., 10 lbs.; pH, 10 to 10.5; odorless, dilutable with water; coverage, 50 ft.²/lb. Produces tear bond on dry or wet finished Fourdrinier kraft shipping containers; flows evenly on machine sealing rollers; seals and holds at rate of 33 cases per min. Suggested Uses: Fast sealing of corrugated shipping containers by means of Ferguson, Standard-Knapp, ABC, Elliott Automatic Sealing Machines. Commercially available. Paisley Products, Inc.

CATALYST AC-4

A 50% aq. solution of organic salt. Color, buff; pH, 8.8. Used as a catalyst for melamine resins, particularly Resloom HP. Availability: Commercial quantities. Monsanto Chemical Co., Merrimac Div.

CELANTHRENE* FAST PINK 3B

A direct dyeing acetate color suitable for the production of a wide range of pastel shades of pink, lilac and lavender as well as for shading; has high affinity for both acetate rayon and nylon; is compl. dispersible and has excellent leveling and penetrating characteristics; shows very good fastness to crocking, hot moist pressing, perspiration, sublimation, dry cleaning and good resistance to washing; is suitable for materials that must withstand light and laundering. The light fastness on nylon is much superior to that of most acetate dyes on nylon. It possesses the necessary physical properties for producing speck-free prints by conventional printing methods. The prints are non-subliming and their fastness toward most color-destroying influences is equiv. to that obtained by dyeing. In combination fiber work it stains cotton and rayon noticeably and silk and wool appreciably. E. I. du Pont de Nemours & Co., Organic Chemical Dept.
* Reg. U. S. Pat. Off.

"CELLOSIZE"* HYDROXYETHYL CELLULOSE WP-10

A dry, free-flowing form of hydroxyethyl cellulose; Sp. G. (5% aq. soln.), 1.0175 @ 20/20°C.; viscosity (5% aq. soln.), 900-1,300 cps. @ 20°C., (2% aq. soln.) 30-45 cps. @ 20°C.; sol. in water, complete; surf. tens. (1% aq. soln.), 62 dynes/cm. @ 25°C.; charring temp. 225°C.; forms aq. gel at conc. of 8% at 25°C. Uses: Water-sol. film forming agent, viscosity modifier, and colloidal stabilizing agent with applications in textiles, plastics, cosmetics, paints, adhesives, and ceramics; improving grease resistance of paper; with glyoxal increasing wet strength of paper. Available in commercial quantities. Carbide and Carbon Chemicals Div.
* Trademark

"CELLOSIZE"* HYDROXYETHYL CELLULOSE WP-40

Dry, free-flowing form of hydroxyethyl cellulose; Sp. G. (5% aq. solution), 1.0167 @ 20/20°C.; viscosity (5% aq. solution), 3,000-5,000 cps., (2% aq. soln.), 100-150 cps.; sol. in water, complete; surf. tens., (1% aq. soln.), 60 dynes/cm. @ 25°C.; charring temp., 225°C.; forms aq. gel at conc. of 7% @ 25°C. Uses: Thickening and carrying printing pastes, stabilizing and thickening resin emulsions, improving grease resistance of paper, with glyoxal increasing wet strength of paper, stabilizing emulsion paints, thickening cosmetic and pharmaceutical lotions. Available in commercial quantities. Carbide and Carbon Chemicals Div.
* Trademark

"CELLOSIZE"* HYDROXYETHYL CELLULOSE WP-300

High viscosity, dry, free-flowing form of hydroxyethyl cellulose; Sp. G. (5% aq. soln.), 1.0176 @ 20/20°C.; sol. in water, complete; viscosity (5% aq. soln.), 25,000-35,000 cps. @ 20°C., (2% aq. soln.), 200, 300 cps. @ 20°C. Forms aq. gel at concentration of 6% @ 25°C.; charring temp., 225°C.; surf. tens. (1% aq. soln.), 62 dynes/cm. @ 25°C. Uses: As a thickener for silk screen printing pastes, resin emulsions, pharmaceuticals, cosmetic lotions, shampoos and adhesives. Available in commercial quantities. Carbide and Carbon Chemicals Div.
* Trademark

CHINOLINE YELLOW EXTRA CONC.

Chinoline Yellow Extra Conc. is a non-dusting, acid dye for paper. It possesses excellent solubility in hot water and wets out readily at 70°F. without yielding sediment. It is of particular interest for the beater dyeing of bleached pulps in the production of canary, green and other shades on bond, cover and writing papers as well as other specialties. This color possesses sufficient affinity for the regular paper making fibers to permit its use as a tinting color for unsized papers such as blotting paper. National Aniline Division, Allied Chemical & Dye Corp.

CHOLMETH TARTRATE

$C_{14}H_{30}O_9N_2S$. M.W., 402; white, stable powder; sol. in water; 30% choline, 37% methionine. Suggested uses: As a source of choline and methionine in pharmaceuticals. Availability: Commercial quantities. Chemo Puro Mfg. Corp.

CHROMOLAN GREY G

Chromolan Grey G is a new, non-dusting, pre-metallized, acid dye of unique character. When dyed by the Chromolan method given below it produces neutral grey shades of good fastness to mill washing and scouring, carbonizing, hot pressing and light; very good fastness to perspiration and excellent fastness to domestic washing, alkalies, steaming, cold water, sea water and stoving. When dyed in a neutral bath it yields somewhat stronger and redder dyeings yet comparable in fastness to those made by the Chromolan method. It also produces fast-to-light shades on nylon. National Aniline Division, Allied Chemical & Dye Corp.

CHROMOLAN RED 3B

Chromolan Red 3B is a pre-metallized, acid red producing rose pink shades of good fastness to hot pressing and light, very good fastness to washing, alkalies and perspiration and excellent fastness to crocking, carbonizing, acids, steaming, water and sea water. Because of its good properties it is of interest for the coloring of carpet yarns, knitting yarns, loose wool, slubbing and ladies dress goods. National Aniline Division, Allied Chemical & Dye Corp.

CHROMOLAN VIOLET 2R

Chromolan Violet 2R is a non-dusting, pre-metallized, acid dye producing subdued violet shades of good fastness to perspiration, alkali and sea water; very good fastness to mill washing and scouring and light, and excellent fastness to domestic washing, carbonizing, acids, cold water and rubbing. National Aniline Division, Allied Chemical & Dye Corp.

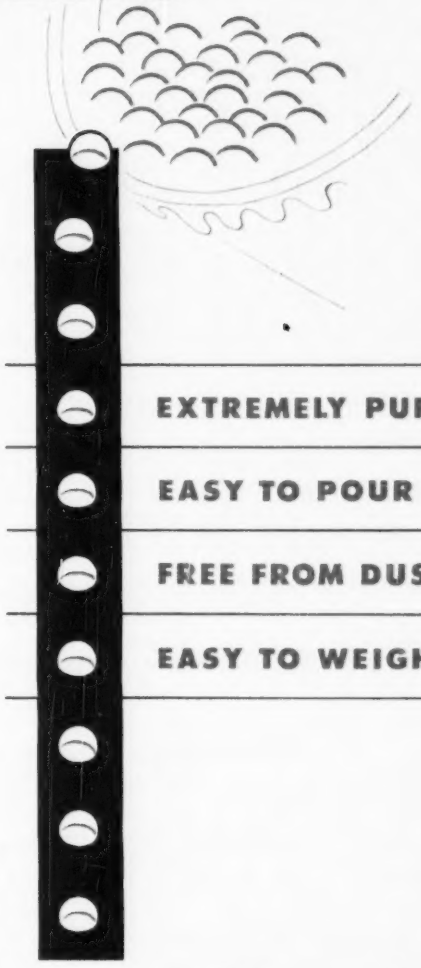
CHROMIUM COMPLEXES OF CARBOXYLIC ACIDS, WERNER TYPE

Furoic, hydroxyacetic, gluconic, 2,4-dihydroxybenzoic, aminoacetic, trichloroacetic, cyanoacetic, and unsaturated C_{20} (drying oil) acids

Baker's

SODIUM HYDROXIDE and POTASSIUM HYDROXIDE

PELLETS



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now available); solutions in isopropanol. The chromium part is strongly adsorbed on neg. charged surfaces such as glass, wood, paper, cotton, leather, wool, etc., with the organic part oriented away from the surface. The organic part will then unite with various polymeric materials, the nature of which will determine which of the chrome complexes is to be used. Suggested uses: For securing a strong, water-resistant bond between neg. charged surfaces and polymeric materials such as resins; for changing the nature of neg. charged surfaces; for insolubilizing various sol. coatings. Availability: Small quantities for exptl. investigation. E. I. du Pont de Nemours & Co., Grasselli Chemicals Dept.

CERFAK NO. 453

A modified, alkyl, aromatic sulphonate; anionic wetting agent having rewetting and detergent properties. Used in the textile industry for all types of wet processing and in other industries as a wetting agent and detergent. It is a light, amber colored liquid, sol. in all proportions in water. Commercially available. E. F. Houghton & Co.

COLLOIDAL ALUMINUM PHOSPHATE "D"

A glassy, thermoplastic, colloidal Al-phosphate milled with ceramic grade clay as a parting agent; free flowing tan powder having a packed density of 0.9. Typical analysis: P_2O_5, 37.2%; Al_2O_3, 22.2%; SiO_2, 10%; ignition loss, 30%; particle size, essentially all through 100 mesh. Suggested uses: To confer high "green strength" and good high temp. bonding to heavy duty refractures and other ceramics, and to substitute for sodium silicates, particularly where the alkalinity of the silicates is undesirable. Availability: Commercial quantities. Monsanto Chemical Co., Phosphate Div.

75% DDT WETTABLE POWDER

A fine, free-flowing, air-milled powder containing 75% tech. DDT. Av. particle size 4.0 microns max. 99.9% passes 200 mesh screen. High DDT content and fineness of division permit water dispersions as high as 5.8% actual DDT. Uses: For spraying of orchards, farm crops, farm buildings, for area spraying. Commercially available. Michigan Chemical Corp.

DEFOAMING COMPOUND #630

An emulsion of fatty acids and fatty acid glycerids. Color, white; pH, 8 to 8.5; weight, 7.7 lbs. per gal.; non-residual odor. Modifies the surf. tens. and interfaces of solutions, counteracting the surf. active agents responsible for major foam development. By attacking the small bubbles throughout the soln., they are stopped or control'ed from forming larger, tough film bubbles which retard air or gas dispersion. Suggested uses: As a foam depressent in paper mills, to aid dispersal of paper fibres; to control foaming tendencies of animal, starch and dextrine, resin and latex adhesive cpds. when subjected to fast agitation or revolution of glue rollers. Commercially available. Paisley Products, Inc.

DEMOCON C-310

This base is diluted with 10 parts warm water to make a fine quality hand and body lotion. Concentrate for making quality cosmetics simply and economically with no technical knowledge or elaborate equipment required. Of interest to private packagers, large institutions, hotel chains and industrial plants as an added convenience to their female employees or patrons. Demo Laboratories

DEMOCON T-210

Liquid anti-perspirant base. Concentrate for making quality toiletries requires only the addition of 3 parts water to make perfumed liquid anti-perspirant now gaining wide popularity in the new "squeezespray" polyvinyl bottles. Demo Laboratories.

DEMOCON W-610

A concentrated germicide which has economical application in commercial and home laundry operation. Extremely small amounts render fabrics bacteriostatic and provide bacteria control and repellency at the same time deodorizing and promoting softness. Demo Laboratories.

DEMOCON W-850

Concentrated chemical base which conveniently makes up into a smooth cream which is effective either as a "waterless" hand cleaner or "invisible glove" to be applied before dirty work is started. Cream is made simply by diluting base with water and appropriate solvents. Wide choice of solvents permisible, thus making possible special creams for particular industries, such as paint, printing ink, automotive, etc. Demo Laboratories.

DEODORANT G-271

A cationic surface active agent with except. effective deodorizing power; quaternary ammonium cpd. of the alkyl morpholinium alkyl sulfate series. Neutralizes such odors as putrifying protein, rancid fat, stale fish, urine, tobacco, mustiness, etc. Suggested uses: Deodorizing public rooms, rendering plants, slaughter houses, and many industrial products. It is also recommended as ingredient of cleaners for simultaneous cleaning and deodorization. Commercially available. Atlas Powder Co.

DIAZINE SCARLET FW

Diazine Scarlet FW is a new dye of very good fastness to washing. It possesses excellent affinity for rayon, cotton and unions of these fibers and leaves acetate rayon practically unstained. When diazotized and developed with National Developer B, it possesses excellent fastness to perspiration, water, water spotting, mercerizing and stoving. It also can be discharged to an excellent white. National Aniline Division, Allied Chemical & Dye Corp.

DIOX*7

tert-Butylisopropylbenzene hydroperoxide, in 50% solution with the parent hydrocarbon material. The hydroperoxide in the pure state is a white crystalline cpd. The 50% soln. is semi-solid at room temp. but completely liquid above 110°F.; flash pt., about 300°F.; high relative stability; satisfactory sol. in certain organic solvents. Useful as an oxidant or "initiator" to promote rapid emulsion polymerization of butadiene and styrene with redox and peroxamine recipes such as those employing ferrous pyrophosphate and polyamines; and to accelerate bulk polymerization of vinyl type polymers. Availability: Pilot-plant quantities. Phillips Petroleum Co.
* Trademark

DULLATONE DC

A cationic duller especially adapted for use on medium and dark shade fabrics without causing shade-change or mark-off. Availability: Commercial. Onyx Oil & Chemical Co.

DYEFIXATIVE 105

39% aq. solution of a cationic resinous compound. Used to reduce bleeding of direct dyestuffs. Sp.G., 1.231-1.251; color, dark green. Availability: Commercial quantities. Monsanto Chemical Co., Merrimac Div.

EFHCOMUL NO. 450

Is a synthetic emulsifier used for the production of stable, self-emulsifying concentrates of the newer chlorinated organic insecticides. It is a clear colored liquid of fairly heavy body, miscible with the various solvents used in these insecticide concentrates. Commercially available. E. F. Houghton & Co.

EMULSIFIER G-21

Edible polyhydric alcohol fatty acid ester; soft plastic solid, white to cream; very slight odor; pH (3% aq. dispersion) approx. 7.0; acid No., 3.0 max.; M.P., 41-46°C.; Iodine No., 59-65 max. Uses: Emulsifier and stabilizer for baked goods, margarine and ice cream; anti-staling and softening agent for bread and cakes. Commercially available. Kessler Chemical Co., Inc.

EMULSIFIER G-970

Sorbitan monostearate; A light tan, waxy, solid ester prepared from a high purity stearic-palmitic acid. Used as an emulsifier for O/W emulsions of all types, generally in combination with Tween* 60. Commercially available. Atlas Powder Co.
* Trademark

EMULSIFIER G-997

Sorbitan monostearate; a light tan, waxy, solid ester prepared from a high purity stearic acid. Used as an emulsifier for O/W emulsions of all types, generally in combination with Tween* 60. Atlas Powder Co.
* Trademark

EMULSIFIER G-2034

A blend of non-ionic emulsifiers, sorbitan monostearate and polyoxyethylene sorbitan monostearate; self-dispersible in warm water and exhibits surface active properties; was developed as a fat crystallization modifier; 1% added to chocolate reduces the tendency to fat bloom. It may be used in conjunction with lecithin or other emulsifiers if desired. Atlas Powder Co.

EMULSIFIER G-2195

Polyoxyethylene stearate; a light tan, soft wax; a water dispersible, surface active agent. It is used in the preparation of O/W emulsions and is effective as a starch modifier. Atlas Powder Co.

EPN-300 INSECTICIDE

A wettable powder containing 27% ethyl p-nitrophenyl thionobenzene-phosphonate as the active ingredient. Use: As a contact insecticide to control certain mites and other insects, during the growing season, on various types of tree fruits including apple, pear, peach, and plum; and on vegetables as well. Commercially available. E. I. du Pont de Nemours & Co., Grasselli Chemicals Dept.

EXPTL. FUNGICIDE 341 SC

A sol. of the acetate of 2-heptadecyl glyoxalidine in isopropanol. Compat. with wettable and flotation sulfurs, lime sulfur, ferbam, bordeaux mixture, "fixed" coppers, hydrated lime, lead arsenate, DDT, nicotine sulfate and parathion; in solutions suitable for agricultural use it is not irritating to the skin; LD_{50} (single, oral dose toxicity) to rats, 5.77 g./kg. Uses; Exptl. use is suggested for the control of apple scab and of cherry leaf spot. Testing is suggested for the control of European red mites, scab and brown rot of peaches, anthracnose and rust of brambles, scab of pears and black spot of roses. Available in 100 lb. quant. to qual. persons for exptl. use for the control of apple scab and cherry leaf spot; in research quant. for prelim. screening and testing for other purposes. Carbide and Carbon Chemicals Div.

EXPTL. FUNGICIDE 5379

A complex cyclic organic cpd. containing N and S; a buff-colored micro-fine powder insol. in water and most common solvents; supplied as a wettable powder suitable for formulation as a dust or a spray; does not appear to be a primary irritant when applied to the skin. Only moderately toxic by single oral dose. Uses: Shows promise for the control of a wide variety of fungus diseases on many crops. Exploratory tests show effective control of apple scab, mildew, snapdragon rust, early and late potato blight, celery and tomato blights, and anthracnose. Available in research quantities for prelim. screening and testing. Carbide and Carbon Chemical Div.

EXPTL. FUNGICIDE 5400

A complex cyclic organic cpd. containing S and N; a yellow-tan micro-fine powder with wide crop tolerance; insol. in water and all common solvents; the fine powder may be used directly as a dry seed treatment or as a slurry; does not appear to be primary irritant when applied to the skin; LD_{50} (sing'e oral dose toxicity) to rats, 0.3 g./kg. Uses: Testing is suggested as a seed treatment on corn, beet, lima bean, cabbage, cucurbit, pea, spinach and tomato seeds; as a foliage fungicide for the control of apple scab, apple rust, apple mildew, tobacco blue mold, early and late blights of celery, potatoes, and tomatoes and anthracnose of tomatoes. Available in research quant. for prelim. screening and testing. Carbide and Carbon Chemicals Div.

FLEXIFLAT PASTE

A vegetable base, plasticized paste, balanced to control penetration of adhesive moisture to porous paper surfaces. Odorless; pH 6; white color. For flat, non-wrinkling pasting of paper and paperboard, fabrics and other porous materials; can be applied by brush, finger, gumming machine, silk screen. Suggested uses: Mounting photographs, blueprints, diagrams, pictures, bookbinding, sample books, envelopes, tipping, all uses where flatness, neatness and permanence are desired. Commercially available. Paisley Products, Inc.

FLEXRICIN 1

Sp. G., 0.958 25°C/25°C; R.I., 1.4575 @ 25°C; viscosity (G.H.) @ 25°C A; SUS @ 210°F. 42. A clear, bright, low visc. liquid suitable as a plasticizer for cellulose nitrate, vinyl chloride type resins, shellac, etc. Commercially available. The Baker Castor Oil Co.

FLEXRICIN 2

Sp.G., 0.968 25°C/25°C; R.I., 1.4630 @ 25°C; viscosity (G.H.) @ 25°C D; SUS @ 210°F. 56. A clear bright, low visc. liquid suitable as a plasticizer for cellulose nitrate, vinyl chloride type resins, shellac, etc. Commercially available. The Baker Castor Oil Co.

FLUOROLUBE LG

$(CF_2{:}CFCl)x$. Av.M.W., 1000; opaque, nontoxic, non-flammable, grease-like material of vaseline consistency. B.P., 125°C @ 1 mm Hg; M.P., approx. 75°C; Sp.G., 1.91 @ 160° F; viscosity @ 160°F, 78 centistokes or 150 cps.; sol. in CCl_4 and most chlorinated solvents; slightly sol. in alcohols and hydrocarbon oils; insoluble in water. Suggested uses: Lubricant in equipment handling O_2, H_2O_2, HNO_3; gasket and packing materials impregnant for pumps or valves handling highly corrosive or oxidizing chemicals; plasticizer for fluorine containing plastics; heat exchange media; hydraulic fluids; instrument oils; high density fluids; and damping fluids. Available in lab. and pilot plant quantities. Hooker Electrochemical Co.

FLUOROLUBE S

$(CF_2{:}CFCl)x$. Av.M.W., 775; colorless, nontoxic, non-flammable, high density, oily liquid; pour pt., —15°C; B.P., 100°C @ 1 mm Hg;

density @ 160°F 1.90; viscosity @ 160°F, approx. 36 centistokes or approx. 70 cps.; sol. in CCl_4 and most chlorinated solvents; slightly sol. in alcohols and hydrocarbon oils; insol. in water. Suggested Uses: Lubricant in equipment handling O_2, H_2O_2, HNO_3; gasket and packing materials impregnant for pumps or valves handling highly corrosive or oxidizing chemicals; plasticizer for fluorine containing plastics; heat exchange media; hydraulic fluids; instrument oils; high density fluids; and damping fluids. Available in lab. and pilot plant quantities. Hooker Electrochemical Co.

FURAFIL

A dark brown powder obtained when corn cobs, oat hulls, or cottonseed hulls are steam cooked in the presence of acid. Used as conditioner and anti-caking agent for fertilizers and other mixed salts; as bulking agent; and as a burn out filler where controlled ignition charact istics are important. Suggested uses: Liquid absorption, filler for asphalt compositions, and as a source of carbon and lignin. Commercially available. The Quaker Oats Co.

FUNGICIDE 466

A copper hydrazine complex, slightly sol. in water. Initial results indicate it to be an extremely effective fungicide. Available in exptl. quantities. Mathieson Chemical Corp.

FLUID F-9

Non-flammable hydraulic fluid. Clear, light yellow liquid; Sp.G., 1.27 @ 25°/25°C.; pour pt., about 5°F.; viscosity index, above 15; viscosity @ 210°F., 5.5-6.0 centistokes; autogeneous ignition pt., above 1100°F. Suggested use: In industrial hydraulic applications where low cost, non-flammability, and high lubricity are desired. Available: Commercial quantities. Monsanto Chemical Co., Organic Div.

GLYCERYL STEARATE 861

A blend of edible monoglycerides of strong hydrophilic character. White, waxy-solid, with slight fatty odor; pH of 3% dispersion, approx. 7.0; M.P., 56.5°C; acid no. 3.0 max., Iodine No. 3.0 max. Uses: Emulsifier and stabilizer for baked goods, margarine, peanut butter, ice cream and chocolate; detackifier for caramel candy and chewing gum; protective coating for hygroscopic tablets. Commercially available. Kessler Chemical Co., Inc.

HERCOFLEX 150

Octyl decyl phthalate plasticizer for vinyl resins. Made from straight-chain octyl and decyl alcohols. Liquid ester of high purity, characterized by an extremely low acid no. and a compl. absence of unreacted alcohol; yields low temp. performance and unusually low volatility. Readily processed with the various vinyl polymers, contributes permanent flexibility, has only slight tendencies to migrate, and shows no bleeding or spewing. Commercially available. Hercules Powder Co.

HERCOFLEX 290

A colorless, neutral ester manufactured from adipic acid and a selected blend of straight chain octyl and decyl alcohols: acid no. 0.1; color (APHA Pt-Co), 50; saponif. no., 288. Used principally as a vinyl plasticizer. It contributes the outstanding low temp. characteristic assoc. with most adipates, and is characterized by permanence and low volatility characteristics usually assoc. with octyl phthalates. Suggested for use where exceptional low temp. characteristics are required and excellent retention of properties on aging is a requisite. Commercially available. Hercules Powder Co., Synthetics Dept.

HERCOFLEX 600

A new monomeric ester plasticizer for vinyls which contributes exceptionally low volatility, good efficiency, and superior low temp. properties; acid number, 0.05; Sp.G., (25°/25°C.), 1.002; pour pt., —67°F.; B.P., @ 1 mm. Hg,232°C.; viscosity @ 100°F., 23.4 centistokes. Is exceptionally useful where service conditions extend over broad temp. ranges. Recommended for use in vinyl plastics requiring retention of properties in spite of exposure to elevated temp. for prolonged periods. Its low viscosity and low solvency for vinyl resins at room temp. makes it an excellent material for use in organosols and plastisols; also recommended because of its excellent stability, high viscosity index, and broad liquid range as a lubricant and synthetic grease base. Available in pilot plant quantities. Hercules Powder Co., Synthetics Dept.

HSC 13

A very efficient pigment dispersing agent; dark amber liquid; Sp. G., 1.015; ash, 0.215; Saybolt visc., 15.75 seconds @ 212°F. Imparts improved flexing, improved abrasion; maintains hardness and shows practically no change in tensile, elongation and tear in Neolite type sole stocks; soles show better stiffness, better finish and less rejects; mild accelerator with some anti-oxidant action and will not discolor light stocks; definite cost savings; in low-grade black sole stocks, improves tear resistance, abrasion and flex resistance. Commercially available. Harwick Standard Chemical Co.

HTH TABLETS

A true, stable calcium hypochlorite product containing not less than 70% avail. chlorine. These tablets are approximately 1" in dia.; 70 to the pound. Have a slow dissolving rate, suggesting many applications in sanitation field as well as the indust. bleaching field. Available in commercial quantities. Mathieson Chemical Corp.

HYDRAULIC FLUID OS-16

Flame resistant hydraulic fluid; clear, light blue mobile liquid; Sp. G., 1.09 @ 25°C.; viscosity, 11.05 centistokes @ 100°F., and 2.65 @ 210°F.; viscos. index, 76; pour pt., —70°F. Suggested use: As an industrial hydraulic fluid in critical applications where lack of toxicity an non-flammability are required over a wide range of operating temp. Available in commercial quantities. Monsanto Chemical Co., Organic Div.

HYDROXYETHYL CELLULOSE

An alkali-sol., water-insol. cellulose ether of good film forming properties; density, 1.49 gm./cc; R. I., 1.534, in film form, @ 25°C.; white, tasteless, odorless, fibrous solid; insol. in all common organic solvents, oils, fats and greases; sol. in alkalies-e.g. 2-18% NaOH; 5-18% KOH. Suitable as a starch replacement in flotation, a thickener for alkaline adhesives and resin sol'ns, a filler for thermosetting resins, a binder for paper coatings, a greaseproof

FAIRMOUNT CHEMICALS

HYDRAZINE BASE • HYDRAZINE HYDRATE • HYDRAZINE SULFATE

Use: Manufacture of dye intermediates, pharmaceuticals, reducing agent, plastic blowing agent.

SEMICARBAZIDE HYDROCHLORIDE • THIOSEMICARBAZIDE

Use: Will readily form Semicarbazones or Thio-semicarbazones with Aldehydes and Ketones.

LIGHT SENSITIVE DIAZO SALTS • DYE COMPONENTS

Use: The stabilized salts are used with the components for coating light sensitive papers.

BENZOTRIAZOLE • AMINOTRIAZOLE • SODIUM CYANATE • SODIUM AZIDE

FAIRMOUNT
CHEMICAL CO., INC.
600 Ferry Street Newark 5, N. J.

layer for paper coating, a component of rug-backing adhesives, a permanent size in textiles and an ingredient of viscose rayon and cellophane. 2 viscosity types are available, one testing 500-800 cps., @ 25°C. when dissolved at 5% conc. in 7% NaOH; other testing 2000-3000 cps. under the same conditions. Available commercially. Hercules Powder Co.

HYDROXYETHYL CELLULOSE ACETATE

A new cellulose product; an ether-ester, made available as the tri-acetate. Properties substantially different from those of cellulose acetate as shown by fact that it is sol. in acetone; colorless; odorless; tasteless flake form; also sol. in 1-4 dioxane, ethyle acetate, 1-nitro propane, chlorinated hydrocarbons and mixtures thereof with alcohols; insol. in alcohols, higher esters, aliphatic hydrocarbons, greases and water. Films have density of 1.31 gm./cc. @ 25°C.; can be plasticized with dimethyl or diethyl phthalates, "Methox," T.P.P., triacetin; dibutyl phthalate is compat. @ room temp. Resin compatibility slightly better than cellulose acetate since Nevillac LX 483, vinsol ester gum, abalyn and Neolyn 43 are compat. Films have better water resist. than cellulose triacetate and good tensile strength, elongation and flexibility. Superior weather resist. Melting range, 215-240°C. Suggested for protect. coatings, printing ink, artif. bristles and fibers, wrapping or photo. film, and light transmitting reinforced window glazing for solaria, hen houses and safety areas. Available semi-commercially. Hercules Powder Co.

IMPRUVOL

Solvent solutions of di-*tert*-butyl-*p*-cresol. Used as an antioxidant and gum inhibitor for transformer oils and aviation gasoline. Availability: Commercial quantities. Koppers Co., Inc., Chemical Div.

KESSCO DC-5B

Non-ionic, dry cleaning "soap," with exceptionally strong hydrophilic properties; polyhydric alcohol ester of fatty acid; amber liquid with slight fatty odor, M.P., 0°C.; acid no., 10.0 max.; Sp. G., 0.961 @ 25°C. Uses: Highly effective and economical detergent for use with Stoddard and similar dry cleaning solvents; water-in-oil emulsifier; eliminates or reduces to a min. hand "spotting" operation. Commercially available. Kessler Chemical Co., Inc.

KESSCO WAX A-21

An acid stable emulsifier particularly suited for preparation of anti-perspirant creams; wax-like solid, with slight fatty odor; white to cream color; water dispersible; M.P., 54-59° C.; Iodine no., 2.0 max.; acid no., 2.0 max.; pH (3% aq. dispersion), approx. 7.0. For use with aluminum sulfate, aluminum chloride, aluminum sulfocarbolate and aluminum formate. Commercially available. Kessler Chemical Co., Inc.

KESSCO WAX A-33

Non-ionic polyhyric alcohol ester; soft-waxy solid with slight fatty odor; white to cream color; pH (3% aq. dispersion), approx. 5.4; M.P., 44-49°C. Iodine No., 3.0 max.; acid no., 5.0 max. Emulsifier for creams, lotions, and ointments in the presence of acid or acid reacting substances. Commercially available. Kessler Chemical Co., Inc.

KESSCO WAX AC

Modified polyhydric alcohol fatty acid ester; wax-like solid, with slight fatty odor; white to cream color; M.P., 55-58°C.; Iodine No., 3.5 max.; acid no., 3.5 max.; pH (3% aq. dispersion), approx. 5.4. Uses: Acid stable emulsifier, for prep. of creams, lotions and ointments, in the presence of acids or acid-reacting substances; recommended for deodorant, anti-perspirant, bleach, lemon and similar preparations. Commercially available. Kessler Chemical Co., Inc.

LX-685

A light amber, heat reactive, thermoplastic synthetic resin, available in several melting ranges; std. grades approx. 125, 135 and 180°C. Acid no., under 2; non-saponifiability; Iodine No., 110 approx.; sol. in aliphatic, aromatic, and chlorinated solvents; compat. with all common vegetable and marine drying oils as well as most varnish resins. Ideal for use in long oil oleo-resinous varnishes, particularly with soft drying oils, where it imparts excellent drying qualities and superior reagent resistance. Also in heat set inks, light colored floor tile, and special coatings such as concrete paints, porch and deck enamels, gasoline and grease-proof coatings and fast drying aluminum paints. Commercially available. The Neville Co.

LX-763

A new type of low Iodine No., inert resin derived from coal tar and characterized by its tack free, highly grease-proof properties. Available in exptl. quantities with melting pts. as high as 130°C.; amber color; high cloud pt. in aliphatic solvents; sol. in aromatic and chlorinated solvents. This resin shows particular promise in floor tile and special oil and grease-proof coatings. The Neville Co.

MAPROFIX LK

Sodium salt of a sulfated fatty alcohol mixture; principally sodium lauryl sulfate; white powder; 90-92% active material; sol. in water; active ingredient sol. in alcohol; compatible with dilute acids, alkalies and with most electrolytes. Foaming and emulsifying agent; excellent detergent and dispersing agent; used in rug and upholstery cleaners; in shampoos and other cosmetics. Availability: Commercial. Onyx Oil & Chemical Co.

MAPROFIX TLS

Triethanolamine salt of a sulfated fatty alcohol mixture; principally triethanol ammonium lauryl sulfate. Cream-colored paste; 85-88% active material; sol. in water and alcohol; compatible with dilute acids and alkalies. Foaming and emulsifying agent; excellent detergent for commercial and industrial cleaners; in shampoos and other cosmetics. Availability: Commercial. Onyx Oil & Chemical Co.

MERAC

Physical state, deep red to brown liquid; Sp. G., 1.034 @ 20°C.; sol. in alcohol; miscible with water. Use: Liquid accelerator for natural and synthetic rubber latex. Available in commercial quantities. Sharples Chemicals, Inc.

MERLON KR-2

A 55% aq. dispersion of polyvinyl acetate resin. Color, white; free acid, less than 0.15%; viscosity, 500 cps. Used to impart stiffening effect to textile fabrics. Availability: Commercial quantities. Monsanto Chemical Co., Merrimac Div.

METALYN

A distilled highly refined neutral methyl ester of tall oil. Acid, no., 2; color (Gardner 1933), 10; saponif. no., 162; bromine no., 72; viscosity @ 100°F., 15.9 centistokes. Suitable as a sec. plasticizer and lubricant in plastics, as a combined softener and tackifier in adhesives, as a compounding aid in rubber processing, as a textile lubricant, as a sulphur carrier in lubricants, and as a plasticizer for high melting alcohol-sol. resins. Commercially available. Hercules Powder Co., Synthetics Dept.

MITICIDE 230

A dihydrazide which is safe to foliage and non-toxic to warm-blooded animals, showing excellent control of red spiders. Available in exptl. quantities. Mathieson Chemical Corp.

MODICOL* S

An anionic hydrophilic surface active chemical. Color, dark amber; moisture, 40.0%; alkali, 1.5%; sol., 10% solution clear. Used 1.0% on weight of solids to promote mechanical stability in all latices and chemical stability in synthetic latices; is finding greatest usefulness in fiber saturation processes. Commercially available. Nopco Chemical Co.

*Reg. U. S. Pat. Off.

NEBONY

A low cost, very mild odored, non-reactive, dark, neutral, thermoplastic resin derived from petroleum. Several melting pts. ranging up to 120°C., cube-in-mercury method; sol. in aromatic and chlorinated solvents, ketones and esters; insol. in water, alcohols, and glycols; compatible with alkyd, phenolic, coumarone, styrene and natural resins; and with rosin, rubber and chlorinated rubber; compat. in certain proportions with ethylcellulose, polyvinyl acetate and polyvinyl copolymers; incompatible with cellulose acetate and nitrate, melamine and urea; excellent reagent resistance. Uses: Mastic and rubber floor tile, rubber compounding, phonograph records, automobile undercoatings, fibreboard and paper impregnation. Commercially available. The Neville Co.

NEOPRENE LATEX TYPE 735

An aqueous, alkaline dispersion of polymerized chloroprene; 34% solids. Especially developed as a beater additive for increasing the wet strength, tear resistance and folding endurance of paper. Commercially available. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

NEOPRENE TYPE RT

A chemical rubber made by interpolymerization of chloroprene and styrene. Like other neoprenes, Type RT resists oils, greases, chemicals, sunlight and weathering, abrasion, oxygen and ozone; imparts improved retention of tack and pliability to unvulcanized compositions. Its vulcanizates resist stiffening due to prolonged exposure to low temp. Commercially available. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

NEOPRENE TYPE W

A chemical rubber composed of polymerized chloroprene. Type W resists oils, greases, chemicals, sunlight and weathering, abrasion, oxygen and ozone; extremely stable in storage and has excellent processing characteristics. Its vulcanizates have unusually good resistance to compression set. Commercially available. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

NEUTRACYL* BLACK N

Has good neutral affinity for both nylon and wool; produces reddish shades of black on nylon, greenish-black on wool; very good fastness to light; good resistance to perspiration, sea salt water, dry-cleaning, washing, etc.; can be shaded with Neutracyl* yellow to produce grays on nylon. Exhaustion of heavier shades can be assisted by addition of ammonium acetate near end of dyeing cycle. E. I. Du Pont de Nemours & Co., Organic Chem. Dept.

*Trade-mark.

NEUTRACYL** BLUE G

Has high saturation level; especially designed for application to nylon from a neutral bath; has good light fastness on nylon and good wet fastness. When combined with other Neutracyl dyes, a variety of shades with very good resistance to light can be obtained; is also of value for dyeing wool where it shows good fastness to dry cleaning, hot moist pressing, sea salt water, crocking and washing. Recommended uses: Suiting fabrics, shirtings, automotive upholstery and other transportation fabrics, sportswear and athletic goods. When dyeing nylon or wool fabrics containing effect threads, it stains acetate, cotton and rayon noticeably and stains silk very much. Stability to water repellent aftertreatments and resin finishes is very good, also has fairly good discharge properties in light to medium strengths. E. I. du Pont de Nemours & Co., Organic Chemicals Dept.

* Trademark.

NEUTRACYL** YELLOW 3RD

A neutral dyeing color developed especially for application to nylon and having the advantage of a high saturation level; yields reddish-yellow shades that have very good resistance to light and wet processing; when shaded with a blue produces a range of tan and khaki shades; can also be employed for dyeing wool where it has fastness properties comparable, in most cases, to those on nylon. Recommended for automotive upholstery fabrics, draperies, suitings, shirtings and related items requiring a high degree of resistance to light. Of value for dyeing the nylon component of nylon-cellulosic unions as it shows very little staining of cotton, rayon and acetate. Good stability when subjected to resin and other aftertreatments. E. I. du Pont de Nemours & Co., Organic Chem. Dept.

* Trademark.

NEUTRACYL** YELLOW N

A fast-to-light, neutral dyeing color developed especially for application to nylon. Has a high saturation level and yields reddish shades of yellow with good wet fastness characteristics on staple, top, tow, yarn and piece goods; also an excellent color on woolens and worsteds where it has fastness properties similar to those on nylon. Recommended for such materials as upholstery fabrics, suitings, shirtings, sportswear and sewing thread where very good resistance to light and washing is desired; useful as a shading color with a Neutracyl blue or black for gray shades; shows very little staining on cotton and the synthetic cellulosic fibers; has very good stability to resin finishes and water repellent aftertreatments. E. I. du Pont de Nemours & Co., Organic Chemicals Dept.

* Trademark.

NEUTRONYX 650

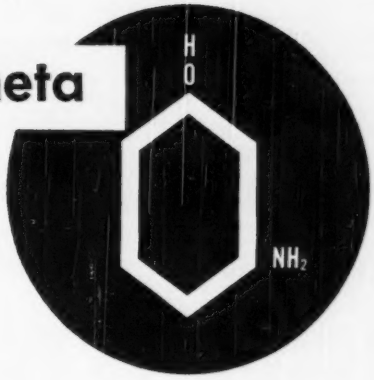
A clear, non-ionic polyglycol ether which has good wetting and detergent properties. Approx. 85% active material; sol. in water and alcohol; a low foaming wetting agent. Applicable in acid and alkaline media and in hard water; compatible with either anionic or cationic materials. Availability: Semi-commercial. Onyx Oil & Chemical Co.

NOPCOBOND C

A 100% active fatty derivative; homogeneous, dark brown, viscous liquid; acid no., 135. An asphalt additive for increasing adherence of bituminous material to wet aggregate. Used 1% on weight of straight or cutback asphalt. Commercially available. Nopco Chemical Co.

NOPCOFLOC B

Complex fat derivative exhibiting simultaneously cationic and nonionic surface active properties; 100% active; brown, viscous liquid; miscible in mineral oil. Valuable as an additive to motor oil to coagulate sludge and facilitate its removal on filters. 0.1 to 0.3% based on weight of motor oil is suggested concentration. Commercially available. Nopco Chemical Co.



—an intermediate in the preparation of:

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antioxidants and stabilizers
Chrome Brown P
Fur Brown GG
para-aminosalicylic acid

EASTMAN aminophenols

para

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NOPCOSET M

Complete resin emulsion type adhesive; white emulsion; 55.0% solids; readily dispersible in water; viscosity, 20,000-30,000 cps. Deposited films are capable of being heat sealed @ 125°C. Product exhibits exceptional bonding due to internal plasticization of polymer. Commercially available. Nopco Chemical Co.

NOPCO® SOAP C

Dry sodium soap of a mixture of unsat. aliphatic and resin acids; fine, light tan, free-flowing powder; moisture, 3.0% max.; glycerine, nil; silicates, nil; salt, nil; free alkali, 0.5% max.; titre, 10-15°C.; readily sol. in hot or cold water. Used in solution form for dipping milled rubber stock, and for spray application on mechanical rubber parts, to prevent sticking. Also an excellent alternate in metal cleaning, electrolytic and alkaline cleaning cpds. Commercially available. Nopco Chemical Co.

*Reg. U. S. Pat. Off.

NOPCO® SOFTENER #73

100% active oleic acid amide, soft amber paste; pH (2% solution), 4.7. Used extensively in paper industry for softening and rewetting various grades of tissue and toweling. In manufacture of specialty grades requiring unusual high tearing strength, the addition of 1.0% gives an increase in tear value of 100 points over unbeaten tearing strength. Commercially available. Nopco Chemical Co.

*Reg. U. S. Pat. Off.

OIL BLACK PEPPER SUBSTITUTE

A part-for-part replacement for the natural oil, made principally from natural products, of which a small percentage is derived from pepper spice. Has gained widespread approval for use in all food products, including meat products. In addition to fidelity of duplication, it offers advantages of uniformity, ready availability, great economy and freedom from wide and unpredictable price fluctuations. Availability: Commercial quantities. Fritzsche Brothers, Inc.

PARAPLEX G-60

A polymeric-type plasticizer for vinyl compounds. Appearance, clear; odor, slight, oily; color (varnish scale), 1 to 2+; acid no., 1.0; viscosity, 200 to 300 cps. @ 25°C. Vap. P., less than 1 mm. of Hg at 330°C.; percent by weight having a mole. weight below 800, less than 0.8. Used as a plasticizer-stabilizer for vinyl cpds.; particularly in vinyl solutions and dispersions; and as a plasticizer-stabilizer for chlorinated hydrocarbons and nitrocellulose. Availability: Plant scale. Rohm & Haas Co., The Resinous Products Div.

PARASPRED

Soft, wax-like, non toxic solid; color, cream to yellow; M. P., 92°-97°F. (33°-37°C.). Suggested uses: Spreading agent, plasticizer and penetrating agent for paraffin and microcrystalline waxes. Commercially available. Glyco Products Co., Inc.

PENNSALT AC-19

A conc., free flowing, granular acid type cleaning cpd. containing 100% active ingredients with no fillers, abrasives or extenders. Used at conc. of 9-12 oz./gal. and applied by manual or mech. methods it will remove rust, stains and oxides from painted surfaces without attacking, marring or softening the paint. Designed especially for exterior cleaning of railroad passenger coaches, it will rinse freely from cleaned surfaces and windows on application of water spray. Not only is it inhibited to prevent corrosion but it is also buffered in the optimum cleaning range. Commercially available. Special Chemicals Dept., Pennsylvania Salt Mfg. Co.

PENNSALT CH-70

A clear, viscous, tacky, yellow to amber resinoid containing 67.70% chlorine; Sp. G., 1.53-1.63; R.I., 1.559-1.561 (N_D^{20}); viscosity @ 210°F., 4100, and @ 300°F., 100 (Saybolt Universal Seconds); no flash and fire pts.; non-toxic; non-oxidizing; non-hydrolyzing; good thermal stability and electrical properties; sol. in industrial solvents; and compat. with industrial resins. Suggested uses: As a compound of fire-retardant systems for the impregnation of textiles, wood, paper laminates, fibre board, and insulating media; as a plasticizer and extender in protective coatings; as a component of specialty inks to increase adhesion; as an additive for specialty lubricants. Semi-commercially available. The Pennsylvania Salt Mfg. Co.

PENNSALT CH-73

A brittle, yellow to amber resin containing 73% comb. chlorine; Sp. G., 1.74 @ 20°C.; R.I., 1.600 (N_D^{20}); flash and fire pts., none; S.P., 65°C.; non-toxic; non-oxidizing; non-hydrolyzing; good thermal stability and electrical properties; sol. in industrial solvents; compat. with industrial resins. Suggested uses: As a component of fire-retardant systems for the impregnation of textiles, wood, paper laminates, fibre board, and insulating media; as a plasticizer and extender in protective coatings; as a component of specialty inks to increase adhesion; as an additive for specialty lubricants. Semi-commercially available. The Pennsylvania Salt Mfg. Co.

PENTALYN K

An ester of pentaerythritol and a new polymeric resin acid, product combining a particularly high softening pt. with properties of excellent solubility and low viscosity in low cost aliphatic solvents. Softening pt. (Hercules Drop Method), 190°C.; softening pt. (Ball and Ring), 172°C.; acid no., 20; is broadly compat. with waxes and rubbers, both natural and synthetic; suitable for use in heat-set printing inks and in rubber-based adhesives requiring strength and delamination resistance at elevated temp. Commercially available. Hercules Powder Co., Synthetics Dept.

PERFLUOROCARBON THICKENED OIL FCX-474

Perfluorolube Oil FCX-412 plus thickener; viscosity, 5235 cps. @ 100°F., 21.1 cps. @ 210°F. Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C.; resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: Lubricant for use in presence of solvents or highly reactive chemicals or for use at high temp., anti-sticking agent, impregnant for gaskets and packings. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

PERFLUOROCARBON THICKENED OIL FCX-475

Perfluorolube Oil FCX-512 plus thickener; viscosity, 372 cps. @ 100°F., 10.7 cps. @ 210°F. Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C.; resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: Lubricant for use in presence of solvents or highly reactive chemicals or for use at high temp. anti-sticking agent, impregnant for gaskets and packings. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

PERFLUOROCARBON THICKENED OIL FCX-493

Perfluorolube Oil FCX-512 plus thickener; viscosity, 575 cps. @ 100°F., 17.1 cps. @ 210°F. Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C.; resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: Lubricant for use in presence of solvents or highly reactive chemicals or for use at high temp., anti-sticking agent, impregnant for gaskets and packings. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

PERFLUOROCARBON THICKENED OIL FCX-561

Perfluorolube Oil FCX-412 plus thickener; viscosity, 127± 4 cps. @ 210°F. Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C.; resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: Lubricant for use in presence of solvents or highly reactive chemicals or for use at high temp., anti-sticking agent, impregnant for gaskets and packings. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

PERFLUOROGREASE FCX-409A

Perfluoroblue Oil FCX-412 plus thickener. Chemical properties: Extremely stable and chemically inert; thermally stable to 400° C.; resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: Lubricant for use at +50°F. to +250°F. in contact with solvents or highly reactive chemicals, plugcock lubricant. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

PERFLUOROGREASE FCX-441

Perfluorolube Oil FCX-512 plus thickener. Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C.; resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: Stopcock lubricant for use in contact with solvents or highly reactive chemicals at temp. of 0-80°C. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

PERFLUOROGREASE FCX-517

Perfluorolube Oil FCX-512 plus thickener. Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C.; resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: lubricant for use at −25°F. to +125°F. in contact with solvents or highly reactive chemicals, plugcock lubricants. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

PERFLUOROGREASE FCX-563

Perfluorolube Oil FCX-412 plus thickener. Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C.; resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: Lubricant for use at +150°F. to +400°F. in contact with solvents or highly reactive chemicals, plugcock lubricant. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

PERFLUOROKEROSENE FCX-329

$C_{12}F_{26}$ (a mixture of perfluorinated aliphatics); M.W., approx. 645; boiling range, 130-180°C. (20-65°C. @ 10 mm.); Sp. G., 1.922 @ 25°C., R.I., 1.3082 @ 20°C.; viscosity 1.80 cps. @ 100°F.; Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C.; resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: Heat transfer medium, electrical insulating fluid, inert reaction fluid, power transmission liquid, thermometric or manometric fluid. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

PERFLUOROKEROSENE FCX-330

Approx. $C_{14}F_{30}$ (a mixture of perfluorinated aliphatics); M.W., approx. 738; Boiling range, 65-130°C. @ 10 mm.; Sp. G., 1.994 @ 25°C.; R.I., 1.3171 @ 25°C.; viscosity, 7.69 cps. @ 100°F.; dielec. const., 2.02 @ 0.1 Kc., 2.00 @ 100 Kc.; dielec. strength, 13,000 v.; D.C. resistivity, 3.1 x 10^{13} ohm-cm. Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C.; resistant to conc. HNO_3, oleum, acid chromate, and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: Heat transfer medium, electrical insulating fluid, inert reaction fluid, power transmission liquid, thermometric or manometric fluid null agent for infra-red absorption analysis. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

PERFLUOROLUBE OIL FCX-412

Approx. $C_{21}F_{44}$ (a mixture of perfluorinated aliphatics); M.W., approx. 1128; boiling range, 130-240°C. @ 10 mm.; R.I., 1.3430 @ 20°C.; viscosity, 2610 cps. @ 100°F. Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C.; resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: Lubricant for use in presence of solvents or highly reactive chemicals or for use at high temp, anti-sticking agent, plasticizer for "Teflon" polytetrafluoroethylene resin. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

PERFLUOROLUBE OIL FCX-512

Approx. $C_{30}F_{62}$ (a mixture of perfluorinated aliphatics); M.W., approx. 1038; boiling range, 70-240°C @ 10 mm.; Sp. G., 2.059 @ 25°C.; R.I., 1.3369 @ 20°C.; viscosity, 186.5 cps. @ 100°F. Chemical properties: Extremely stable and chemically inert; thermally stable to 400°C. resistant to conc. HNO_3, oleum, acid chromate and permanganate, Cl_2, HF, caustic above 100°C. Possible uses: Lubricant for use in presence of solvents or highly reactive chemicals or for use at high temp., anti-sticking agent, plasticizer for "Teflon" polytetrafluoroethylene resin. Availability: Small quantities for exptl. investigations. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

PLASTICIZER 1203

Yellow to light amber viscous liquid. R.I., N_D^{25}, 1.5150. Suggested uses: Plasticizer for vinylite cellulose acetate, and ethyl cellulose. Availability: Research quantities. Victor Chemical Works.

PLASTICIZER 1213

Light amber, oily liquid at room temp. becoming very viscous at −38°C. R.I., N_D^{25}, 1.4950-1.4985; Sp.G., 1.095 @ 25/4°C.; insol. in water; sol. in common organic solvents. Suggested uses: Plasticizer for vinylite and nitro cellulose. Availability: Research quantities. Victor Chemical Works.

PLASTICIZER 1814

Pale yellow oil; insol. in water; sol. in all proportions in ethanol, ether, acetone, benzol, heptane, ethyl acetate, and carbon tetrachloride; becomes viscous without freezing at −40°C.; Sp. G., 0.967 @ 25°C.; R.I., N_D^{25}, 1.4616. Suggested uses: Plasticizer for ethyl acetate and nitro cellulose. Availability: Research quantities. Victor Chemical Works.

PLASTICIZER 1816

Yellow oil; insol. in water; sol. in all proportions in ethanol, ether, acetone, benzol, heptane, ethyl acetate, and carbon tetrachloride; becomes viscous without freezing at −40°C.; Sp. G., 1.012 @ 25°C.; R.I., N_D^{25}, 1.4650. Suggested uses: Plasticizer for vinylite and nitro cellulose.

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SPECIFICATIONS

Titre °C	25—30
Color Gardner 1933	2—4
Color Gardner 1933—After Heat Test to 500°F	4—7
Unsaponifiable %	0.3—1.5
Saponification Value	198—202
Acid Value	197—201
Iodine Value	125—135

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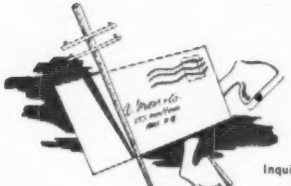

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Availability: Research quantities. Victor Chemical Works.

PLASTICIZER G-1629C

Aryl ether of a polyglycol which is an almost water-white liquid of mild odor; Sp. G. 1.053 @ 25°/25°C.; viscosity 27 cps. @ 25°C.; R.I., 1.512 @ 25°C.; I.B.P., 150°C. @ 10 mm.; slightly sol. in water, very sol. in aliphatic and aromatic hydrocarbons, ketones, ethers, alcohols and esters; compat. with cellulose esters and ethers; a good solvent for cellulose acetate. Recommended as a plasticizer for all types of cellulose deriv., particularly cellulose acetate. Molded articles are light in color, have very high impact strength and good dimensional stability. Commercially available. Atlas Powder Co.

PLASTICIZER G-3140

A pale colored liquid ester; R.I., 1.523 @ 25°C., I.B.P., >200°C. @ 1 mm.; Sp. G., 1.198 @ 25°/25°C.; viscosity, 830 cps. @ 25°C. Insol. in water; sol. in aromatic hydrocarbons, esters, ethers, and ketones; compat. with cellulose esters and ethers and somewhat compat. with vinyl resins. Recommended particularly for use as a plasticizer for cellulose acetate and nitrocellulose films applied from solution. Has very low volatility and low water sensitivity and imparts excellent flexibility and fold resistance to cellulose acetate films. Commercially available. Atlas Powder Co.

PLASTICIZER G-3158

A very pale colored liquid ester, titer, 16°C., R.I., 1.4805 @ 25°C., I.B.P. >200°C. @ 1 mm.; insol. in water; sol. in aliphatic and aromatic hydrocarbons, esters, ethers, ketones and vegetable oils. Compat. with cellulose acetate-butyrate, and cellulose propionate. Imparts excellent impact strength to articles molded from those plastics. Also recommended for use as a sec. plasticizer for polyvinyl chloride resins in conjunction with an active solvent plasticizer, where its extr. low volatility, high water resist. and good light stability can be used to good advantage. Commercially available. Atlas Powder Co.

PLASTICIZER G-3160

A solid, crystalline, sat. ester; M.P., 81.82°C.; insol. in water; partially sol. in aromatic hydrocarbons and ketones. Somewhat compat. with cellulose esters and ethers and with polyvinyl chloride. Suggested uses: As a plasticizer in specialty applications where advantage can be taken of its sharp M. P. as in heat sensitive adhesives. Commercially available. Atlas Powder Co.

PLASTICIZER G-3162

A solid, crystalline, unsat. ester; M.P., 126-127°C.; insol. in water, partially sol. in aromatic hydrocarbons and ketones. Somewhat compat. with cellulose esters and ethers and polyvinyls. Suggested uses: As as plasticizer in speciality applications such as heat sensitive adhesives. Commercially available. Atlas Powder Co.

PLASTICIZER G-3170

A pale colored liquid ester; Sp. G., 0.961 @ 25°C./25°C.; R.I., 1.4822 @ 25°.; viscosity, 18 cps. @ 25°C.; I.B.P. >200°C. @ 1 mm.; insol. in water; sol. in aliphatic and aromatic hydrocarbons, esters, ethers, ketones and vegetable oils; compat. with cellulose acetate-butyrate and cellulose propionate. Recommended as a plasticizer for those materials; molded articles have excellent impact strength; also a sec. plasticizer for polyvinyl chloride and copolymer resins in conjunction with an active solvent plasticizer. It imparts very high moisture resistance, very low volatility, excellent heat stability and excellent low temp. flexibility to compositions. Commercially available. Atlas Powder Co.

PLASTICIZER G-3171

A pale colored liquid ester; titer, 15-16°C.; Sp. G., 0.950 @ 25°/25°C.; R.I., 1.4866 @ 25°C.; viscosity, 24 cps. @ 25°C.; I.B.P., 180°C. @ 1 mm.; insol. in water; sol. in aliphatic and aromatic hydrocarbons, esters, ethers, ketones and vegetable oils. Compat. with cellulose acetate-butyrate and cellulose propionate. It imparts very high impact strength, low volatility and high water resistance to molded articles prepared from those resins. Recommended as a secondary plasticizer for polyvinyl chloride in conjunction with an active solvent plasticizer; as a plasticizer it imparts low volatility, very low water sensitivity, good low temp. flexibility and very good heat and light stability. Commercially available. Atlas Powder Co.

PLASTICIZER KP-504

Bis(dimethyl-benzyl) carbonate (tech. grade). $(CH_3)_2C_6H_5CH_2OCOOCH_2C_6H_5(CH_3)_2$. M. W., 298.37; Sp. G., 1.081 @ 25°/4°C; R.I., 1.5460 @ 25°C.; B.P., 209-222°C. (4 mm.); mid B.P., 219°C. (4 mm.); Vap. P., less than 0.1 mm. @ 150°C., 1.3 mm. @ 200°C., ester value, 90% min.; acidity, none; hydrolysis, none; M. P., about —22°C.; visc., 158 cps. @ 20°C.; surf. tens. 37 dynes/cm @ 20°C; thermal expan., (10-40°C.), 0.00072 gms./cc/°C.; flash pt., 415°F.; fire pt., 460°F.; wgt. per gal., 9.05 lbs.; power factor @ 25°C., 0.0002 @ 1000 cps., 0.0035 @ 60 cps.; DC resistivity @ 25°C., 30 x 10^6 megohm-cm.; insol. in water; insol. or limited sol. in glycerine, glycols, amines, and lower aliphatic alcohols; compl. miscible with most other organic solvents; compat. with vinyl resins, synth. rubbers, nitrocellulose, ethyl cellulose and polystyrene; odor, characteristic aromatic; color, light yellow, less than 500 APHA Pt-Co. Contains up to 10% bis (dimethyl benzyl) ether; is a low cost primary plasticizer of special value in the vinyl field as a result of its electrical properties, resist. to migration, reduced flammability, high heat stability and resist. to hydrolysis. Suggested uses: As plasticizer and solvent in the plastic, surface coating, printing ink and textile fields; as lub. additive, heat transfer medium, hydraulic fluid, perfume additive, flavor conc., fungicide and insecticide. Availability: Commercial quantities. Ohio-Apex, Inc.

PLASTICIZER KP-555

Bis(dimethyl benzyl) ether (tech. grade). $(CH_3)_2C_6H_5CH_2OCH_2C_6H_5(CH_3)_2$. M. W., 254.36; Sp. G., 1.004 @ 25°/4°C.; R. I., 1.5528 @ 25°C.; B. P., 179-187°C. (4 mm.); mid B. P. 184°C. (4 mm.); Vap. P., 0.6 mm. @ 150°C., 8.0 mm. @ 200°C.; acidity, none; M.P., about —49°C.; visc., 29 cps. @ 20°C.; surf. tens., 35 dynes/cm. @ 20°C.; thermal expans., (10-40°C.), 0.00070 gm./cc./°C.; flash pt., 370°F.; fire pt., 395°F.; power factor @ 25°C., 0.0006 @ 1000 cps., 0.01 @ 60 cps.; DC resistivity @ 25°C.; 13 x 10^6 megohm-cm.; insol. in water; insol. or limited sol. in glycerine; glycols and some amines; comp. miscible with most other organic liquids; compat. with vinyl resins, synthetic rubbers, ethyl cellulose, polystyrene and nitrocellulose; odor, characteristic aromatic; color, water-white to pale yellow, less than 100 APHA Pt-Co; is a low cost plasticizer with special merit for synthetic rubbers. Combines excellent electrical properties, high heat stability and inertness to water or alkali hydrolysis. Suggested uses: As a plasticizer and solvent in the plastic, surface coating, printing ink and textile fields; as a lub. additive, heat transfer medium, hydraulic fluid, perfume additive, flavor concentrate, fungicide and insecticide. Availability: Pilot plant quantities. Ohio-Apex, Inc.

POLYAMIDE RESIN SUSPENSOID

Cationic, water dispersion of Polyamide Resin formed by the condensation of dimerized vegetable oil acids with ethylene diamine; acid no. 3-5; opaque, white liquid of med. viscosity with a solids content of 35-40%. Remarkably stable, the suspensoids can be subjected to freezing and thawing without coagulation; easily applied to papers, cloth, wood, metal foils and other surfaces, depositing a film composed of discrete particles, indistinguishable to the naked eye. Films dry rapidly, do not block even under severe press. Suggested uses: Heat-sealing adhesive and coating, "wet stick" adhesive, laminant, textile treatment, pigment binder for leather, protective and decorative coating, binder for wood flour, paper pulp and cork. Availability: Pilot plant quantities. General Mills Research Lab.

POLYBUTADIENE, LIQUID

A unsat. hydrocarbon polymerized from butadiene; M.W., ca. 1300; color (Gardner), 10.0; Sp. G., 0.9097 @ 60/60°F.; R. I., 1.520 @ 68°F.; viscosity, 435 Saybolt Furol Seconds @ 100°F.; Ash, 0.013%; Iodine No., ca. 370; flash pt. (COC), ca. 300°F. Suitable as an extender and/or modifier for semi-drying and drying oils, rosin, tall oil and other unsat. resin-forming materials; also as a softener and plasticizer for various synthetic rubber elastomers, where its inherent unsaturation allows for vulcanization. Availability: Pilot-plant quantities. Phillips Petroleum Co.

POLYCO 220

Polystyrene emulsion containing 50% minimum resin solids; pH 8-9. Used primarily to reduce tack, increase film strength and hardness of other resin copolymers such as butadiene-styrene, butadiene-acrylonitrile. Very fine particle size; stable to high water dilutions. American Polymer Corp.

POLYCO 350

40% butadiene; 60% styrene copolymer latex. Standardized for emulsion paint industry. Modified for paper coating as Polyco 350 FP, depositing a softer film and possessing better clay binding properties. 45% solids. pH 8-9. American Polymer Corp.

POLYCO 369

High-viscosity polyvinyl acetate emulsion containing 55% minimum resin solids. Viscosity obtained by control of polymerization conditions and not by addition of artificial thickening agents. Useful in adhesive and coating formulations where high viscosity, good machineability and ease of compounding are important requisites. Viscosity 25,000-30,000 cps. American Polymer Corp.

POLYCO 380

Styrene copolymer emulsion containing 50% minimum resin solids. Deposits flexible water and grease-resistant film. Easily compounded with plasticizers and thickeners. Extremely stable in presence of metal salts. Used in water paints and paper coatings. pH 4-5. American Polymer Corp.

POLYCO 394

High styrene-butadiene latex containing 45% minimum resin solids. Characterized by excellent mechanical stability and tolerance for metallic salts. Deposits flexible tough film with high pigment binding power. Recommended for paper coatings, emulsion paints. pH 8-9. American Polymer Corp.

POLYCO 396

High solids, medium viscosity polyvinyl acetate emulsion containing 60% minimum resin solids. Viscosity 1200-1500 cps. Useful in adhesive compounding where adaptability for compounding with other materials and quick-grab drying and setting features are important. American Polymer Corp.

POLYCO 397

70% butadiene; 30% styrene latex with same general properties as Polyco 394. Recommended for blending with Polyco 394 or other latices where extreme flexibility is desired. American Polymer Corp.

POLYCO 398

20% butadiene; 80% styrene latex with same general properties as Polyco 394. Recommended for blending with Polyco 394 or other latices where toughness, less tack and hardness are desired. American Polymer Corp.

POLYCO 895-30

Extremely fine particle size vinyl acetate copolymer emulsion which deposits clear, hard, semi-flexible grease-resistant film. Particularly adapted for textile finishing and paper coating. Does not settle at high dilutions. 35% minimum resin solids. American Polymer Corp.

POLYCO 1678-20

Cationic polystyrene emulsion containing 40% minimum resin solids, pH 4-5. Compatible with other cationic butadiene copolymer emulsions. Recommended for paper and textile applications where the substantive properties of cationics are desirable. American Polymer Corp.

POLYCO 953-7A

Fine particle size vinyl acetate copolymer emulsion containing 55% minimum resin solids. Deposits clear, semi-water-resistant film which becomes extremely water-resistant after heating. Useful in waterproof and heat seal adhesive applications. Adaptable as a launder resistant, non-yellowing textile size which imparts permanent stiffness and hand to all types of fabrics. Viscosity 1250-1600 cps. American Polymer Corp.

POLYCO 1009-28A

Acrylic copolymer polymerized in methyl ethyl ketone. Deposits clear, hard, tough film. Solution stable to addition of alcohol. Used as vehicle for preparing vinyl printing inks. Minimum resin solids 40%. American Polymer Corp.

POLYCO 1040-14B

Fine particle size, water-resistant polyvinyl acetate emulsion containing 55% minimum resin solids. Viscosity 1000-1300 cps. Suitable for formulation of adhesives and as waterproof-pigment binder in coating applications. American Polymer Corp.

POLYCO 1010-48B

Acrylic-styrene copolymer emulsion containing 35% minimum resin solids. Base for formulating snag-resistant finishes for nylon hosiery. American Polymer Corp.

POLYCO 1007-34C

Vinyl acetate-chloride-acrylic tripolymer emulsion containing 50% minimum resin solids. Deposits flexible, grease and water-resistant film. Used primarily for paper coating. American Polymer Corp.

POLYCO 1677-35C

Acrylic copolymer emulsion containing 40% minimum resin solids. Deposits tough, clear, hard, flexible, grease and water-resistant film. Recommended for textile finishing, paper coatings, water paints. pH 5.5. American Polymer Corp.

POLYESTER RESIN G-362AC

A solid type, pulverized, unsat. polyester resin, specially designed for use as a thermosetting polyester binder in the powder method of making fiber preforms. When it is used as a binder for glass fiber preforms and mats, light colored articles are produced. Compatibility and flow with polyester-styrene low pressure laminating resins are excellent and fast wetting of the reinforcement occurs. Catalyzed, stable, and ready for use as binder by mixing with glass fiber, as in the hat machine method. Cures at 375-400°F. in 3-4 minutes, tan color. Availabil-

the case of the

RELUCTANT DRAGON'S BLOOD

. . . how Mallinckrodt Research solved a costly problem for the photo-engraving industry

This illustration, like most you see in your newspapers, magazines and books, was printed from photo-engraved plates—made by etching a sheet of metal with acid to leave the raised lines and dots which transfer ink to paper.

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ity: Semi-commercial production. Atlas Powder Co.

POLYESTER RESIN G-382

A thermosetting solid type pulverized unsat. polyester resin specially suited for formulating into low-pressure laminating resins by dissolving in monomeric vinyl cpds. such as styrene. Resin is stable. Dissolved in styrene as required, the uncatalyzed styrene sol. is stable for several months at room temp. Viscosity of 65-35% resin-styrene sol. is approx. 5000 cps. (25°C.). Laminates and reinforced plastic articles made with this resin show excellent surface gloss and possess no residual styrene odor. Tan colored. M.P., 105-110°C. Not catalyzed. Availability: Semi-commercial. Atlas Powder Co.

POLYESTER RESIN G-390

A thermosetting, solid type, pulverized polyester resin, specially designed for use as a thermosetting polyester binder in the powder method of making fiber preforms. Properties similar to G-362AC. Mats and preforms using this binder are specially resistant to washing during lamination and molding with styrene-polyester low-pressure laminating resins, and exhibit high dry and wet strength. Catalyzed, stable, ready for use as binder. Availability: Semi-commercial. Atlas Powder Co.

POLYESTER RESIN G-395

A thermosetting, solid type, pulverized, polyester resin, specially designed for use as a thermosetting polyester binder in the powder method of making fiber preforms. Properties similar to G-362AC and G-390. Specially resistant to washing during lamination and molding with styrene-polyester low-pressure laminating resins; possesses high dry and wet strength. Catalyzed, stable, and ready for use as binder. Availability: Semi-commercial. Atlas Powder Co.

POLYESTER RESIN G-397

A thermosetting, solid type, pulverized, dead white pigmented polyester resin specially designed for use as a thermosetting polyester binder in the powder method of making fiber preforms where the final product is opaque white in color. Properties similar to G-362AC, G-390, G-395. Catalyzed, stable, ready for use as binder. Availability: Semi-commercial. Atlas Powder Co.

POLYETHANOL RAD-0500

A viscous liquid obtained by reacting Hercules Rosin Amine D with ethylene oxide. A nonionic compound which has shown considerable promise as a corrosion inhibitor for aq. HCl. Sol. in water and organic solvents. Available in drum lots. Hercules Powder Co.

POLYETHANOL RAD-1100

A viscous liquid obtained by reacting Hercules Rosin Amine D with ethylene oxide. Similar to Polyethanol RAD-0500 but contains a higher ratio of ethylene oxide. Compared to Polyethanol RAD-0500, it has improved sol. in water and dil. acids and brines but poorer sol. in organic solvents. Has shown promise as a corrosion inhibitor in HCl and natural brines. Available in drum lots. Hercules Powder Co.

POLYGLYCOL 15-200

A viscous amber liqd.; Sp. G., 1.053 @ 25/25°C.; R. I., 1.4591 @ 25°C.; flash pt., 472°F.; fire pt., 550°F.; viscosity, 205.8 centistoke @ 100°F., 32.3 cstk. @ 210°F.; viscosity index, 138; pour pt., −40°C.; surf. tens., 36.6 dynes/cm @ 25°C.; inf. sol. in acetone, benzene, CCl_4, ether, methanol, H_2O (25°C.). Available commercially. The Dow Chem. Co.

PONTAMINE® DIAZO SCARLET P CONC.

The brilliant scarlet shades produced can be discharged to a good white on both viscose-process rayon and cotton. Betha-naphthol is recommended for develop't. assuring max. strength and fastness. Has very good resist. to dry cleaning, perspiration, steaming, dry crocking, hot moist pressing, AATCC washing #1 and light. Suitable for dyeing of materials to be used for sportswear, dress goods, play clothing, etc. Can be applied to viscose-process rayon and cotton, by normal methods; dissolves easily, has good absorption, produces thoroughly penetrated dyeings and levels well on both fibers; when used on combination fiber fabrics, stains acetate appreciably, stains nylon considerably and dyes silk and wool. E. I. du Pont de Nemours & Co., Organic Chemicals Dept.
*Reg. U. S. Pat. Off.

PONTAMINE® FAST BLUE BLL

A direct dyeing medium blue especially recommended where an unusual degree of resistance to light is req'd.; retains its fastness to light in pale, medium and full shades and is valuable for the dyeing of upholstery and drapery fabrics; for production of taupes and grays for automotive materials. Possesses light fastness; good resistance to mild washing, perspiration, crocking and dry cleaning. Can be applied to all forms of cotton and viscose-process rayon by the usual methods; not recommended for discharge by either the neutral or alkaline methods. Is an excellent shading color for the cotton in cotton and wool unions where the ultimate in light fastness is required; dyes cotton and stains wool in a union dyebath; viscose-process rayon is dyed considerably heavier than cotton but retains approximately the same shade. Acetate is slightly stained while silk and nylon are stained considerably. E. I. du Pont de Nemours & Co., Organic Chemicals Dept.
*Reg. U. S. Pat. Off.

PONTAMINE® FAST VIOLET 4RL

Possesses outstanding fastness to light when applied to either cotton or viscose-process rayon in pale or heavy shades; well suited to production of deep reddish-violet and mauve shades, also useful as a reddening element in the formulation of beige, gray and taupe shades. On rayon it exhibits good resist. to washing, dry cleaning, perspiration and dry crocking. The effect of crush-proofing resin treatments varies with degree of processing and tends to lower the resist. to light and to change the shade bluer; recommended for draperies, upholstery fabrics, sportswear, dress goods, etc. A direct dyeing color that is readily sol., has good absorption, penetrates thoroughly and yields level dyeings; can be applied in machines of all types. In combination fiber work it is particularly suited to the production of acetate white effects and also as a light-fast shading dye for the cotton in cotton-wool unions. E. I. du Pont de Nemours & Co., Organic Chemicals Dept.
* Reg. U. S. Pat. Off.

REDWOOD REZ

A pigmented sealer for redwood; greatly reduces or prevents entirely the darkening, fading, and discoloration that usually occurs with exterior redwood finishes when exposed to weathering. Available for use as an exterior sealer-finish for redwood that will be exposed to repeated wetting and prolonged sunshine. Available in commercial quantities. Monsanto Chemical Co., Western Div.

RESINOUS ALCOHOL

Partial ester of glycerol; 5-6% free hydroxyl groups; a clear, light-colored liquid; viscosity (G-H), O-P @ 25°C.; insol. in water; partly sol. in methanol, 95% ethanol, and glycerol; compl. sol. in glyceride oils, fatty acids, and solvents such as xylene, mineral spirits, acetone, butyl acetate, and cellosolve. Suggested uses: Varnishes, alkyd resins, ester gums, adhesive plasticizers, dispersing agents. Availability: Samples for exptl. investigation. General Mills Research Lab.

ROSIN AMINE D

A primary amine consisting of a mixture of dehydroabietylamine, dihydroabietylamine and tetrahydroabietylamine of 89-93% purity; a pale colored viscous liquid; density, 0.997 @ 25°C.; viscosity @ 25°C., 46.5 poises; B.P. (760 mm.), 344°C.; flash pt., 192°C.; neutralization eqvlt., 310-320; insol. in water; sol. in organic solvents. Used as an additive to asphalt, ceramic inks, flotation reagent, preservative for starch, glue and proteins, fungicide, bactericide, preservative for cellulose, intermediate for prep. of salts and other derivatives. Commercially available. Hercules Powder Co.

ROSIN AMINE D ACETATE (70-80% PASTE IN WATER)

A viscous, pasty to semicrystalline solid obtained by reacting equimolar portions of Hercules Rosin Amine D and acetic acid of proper dilution. Sol. in water and organic solvents. Used as a flotation reagent for silica minerals, asphalt additive, corrosion inhibitor and bactericide in water for secondary recovery of petroleum, fungicide and preservative for cellulose and proteins, wetting agent in tire cord manufacture, algaecide. Commercially available. Hercules Powder Co.

ROSIN AMINE D NAPHTHENATE

A balsam-like solid; color dependent on grade of naphthenic acid used for its preparation. Insol. in water; sol. in hydrocarbon solvents. Has shown promise as a corrosion inhibitor in oil solutions. Commercially available. Hercules Powder Co.

ROSIN AMINE D STEARATE

A waxy, yellowish solid; M.P., about 73°C. Obtained by neutralizing Hercules Rosin Amine D with commercial stearic acid. Insol. in water; sol. in hydrocarbon solvents. Has shown promise as a corrosion inhibitor in oil solutions. Commercially available. Hercules Powder Co.

ROSIN NITRILE D

A pale yellow, waxy solid; insol. in water; sol. in most organic solvents; M. P., 60-70°C.; B. P., 365°C.; flash pt., 204°C. Consists of a mixture of dehydroabietyl nitrile, dihydroabietyl nitrile and tetrahydroabietyl nitrile with about 10% of the normal nonacid constituents of rosin. Useful as an intermediate for the prep. of the amine and has shown some promise as a plasticizer and modifier of plastic compositions. Commercially available. Hercules Powder Co.

RR-10

Mixed dixylyl disulfides; a dark brown liquid.

An agent for accelerating the devulcanization of rubber or GR-S during the reclaiming process. Commercially available. E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Div.

RZ-50

50% solution of N,N-dimethyl cyclohexyl ammonium dibutyl dithiocarbonate in "Cellosolve"; $(C_4H_9)_2NC(SSNH(C_6H_{11})(CH_3)_2$. M.W., 332; clear brown liquid; color (N.P.A.), 8.0 max.; Sp. G., 0.964 @ 25°C. Suggested use: As an ultra-accelerator for vulcanizing rubber cements. Availability: Commercial quantities. Monsanto Chemical Co., Rubber Service Dept., Organic Div.

SANTOLENE C*

Rust inhibitor for light petroleum products. Particularly suitable for inhibiting rust formation in lines and vessels used for the transportation and storage of such materials as gasoline, kerosene and fuel oil. Available in commercial quantities. Monsanto Chemical Co., Organic Div.
* Reg. U. S. Pat. Off.

SANTOLUBE 374*

Oil additive for the formulation of heavy duty motor oils. Imparts detergent-dispersant and corrosion inhibition properties. It also acts as a pour pt. depressant. Available in commercial quantities. Monsanto Chemical Co., Organic Div.
* Reg. U. S. Pat. Off.

SANTOPOID 32*

All-purpose oil additive. Recommended for the formulation of gear lubricants suitable for automotive equipment under high speed and high load conditions. Available in commercial quantities. Monsanto Chemical Co., Organic Div.
* Reg. U. S. Pat. Off.

SOLUDEX

Dextrine base; light brown powder; miscible with cold water; brown sol'n. 3 grades available: 1½ lbs. water to 1 lb. powder; 2½ lbs. water to 1 lb. powder; 3¾ lbs. water to 1 lb. powder. Suggested uses: Case sealing, tube winding, laminating, multiwall bag seams, general paper product manufacturing operations. Commercially available. Paisley Products, Inc.

SOLVENT C100

A chlorinated hydrocarbon solvent; colorless liquid; boil. range, 90-120°C.; flash pt. (COC), 78°F.; Sp. G., 1.16; combined chlorine, about 60%. Suggested uses: In carbon-removing solvents, as a fumigant, as a solvent for insecticides. Commercially available. Wyandotte Chemicals Corp.

SOLVENT C160

A chlorinated hydrocarbon solvent; colorless liquid; boiling range, 120-170°C.; flash pt. (COC), 95°F.; Sp. G., 1.12; combined chlorine about 50%. Suggested uses: In solvents for paints and varnishes, for metal degreasing, for spot removal. Commercially available. Wyandotte Chemicals Corp.

SOLVENT R

A chlorinated hydrocarbon solvent and ether; liquid; color, brown; boil. range, 180-200°C.; flash pt. (COC), 200°F.; Sp. G., 1.16; combined chlorine about 45%. Suggested uses: Solvent for insecticides, in emulsion cleaners. Commercially available. Wyandotte Chemicals Corp.

STABELAN E

An excellent lead-free stabilizer for vinyl and vinyl copolymer resins; Sp. G., 1.17; ash content, 17% ± 0.5%; loss in heat-aging, 2 hrs. @ 220°F., 3.25% ± 0.25%, 1 hr. @ 350°F., 8.75% ± 0.25%; sol. in water @ 25°C.; 0.05 gm. ± 0.005 in 100 cc.; smooth, white homogeneous paste; disperses with extreme ease during hot or cold milling. Highly efficient light stabilizer; produces very clear films of high degree of transparency; compatible with all coloring pigments generally used with polyvinyl chloride resins, inorganic and organic, without affecting their hue. Improves aging of most pigments used or minimizes the bad effect pigments may have on the aging of the resins. Is compat. and very effic. with practically all comm. available plasticizers, such as esters of phthalic, sebacic, phosphoric, recinoleic, adipic, and other fatty acids, as well as the polyester type plasticizers of various mol. wts. and compositions. Requires rel. small amounts of lub. and releasing agents. Does not interfere with heat sealing and printability of cast or calendered film. Commercially available. Harwick Standard Chemical Co.

STABILIZER L PASTE

A barium cpd. with extraordinary light stabilization properties for vinyl resins; consists of 50% by wt. active ingredient, and 50% by wt. of a plasticizer which is a clear, colorless liquid. Sparingly sol. in plasticizers and solvents; practically compl. insol. in water, therefore detracting nothing from the water resistance of vinyl compositions in which it is incorporated. The active ingredient is present in such fine particle size that it affords max. ease of dispersion, most intimate possible mixture with vinyl resin compositions, a min. of opacity. Advance Solvents & Chem. Corp.

SULFOL NO. 448

A non-ionic, self-emulsifiable oil. Used in the textile industry as a fiber and yarn lubricant, having non-gumming non-oxidizing and antistatic properties; forms a stable emulsion with water and does not form metallic soaps in hard water or solutions of metallic salts; is a light amber colored liquid and is neutral. Commercially available. E. F. Houghton & Co.

SULFRICIN

A modified castor oil, chemically reacted to a high hydroxyl value (230). Sp. G., 0.946 @ 25°C.; R.I., 1.4650 @ 25°C.; pour pt., —25°F.; viscosity (G.H.) @ 25°C., D, sap. value, 161; iodine value, 80. The oil is particularly suitable for sulfonation because the large number of hydroxyl groups permits a greater degree of sulfonation and a consequent improvement in the wetting power of the sulfonated oil. Commercially available. The Baker Castor Oil Co.

SYTON

A 30% aq. dispersion of silica; 30% solids; pH, 8.9; particle size, 0.04 microns. Sp. G., 1.10; freely dispersible in water. Used as a spinning aid in manufacturing wool and worsted yarns and as a textile finishing agent. Availability: Commercial quantities. Monsanto Chemical Co., Merrimac Div.

"UCON"* GENERAL PURPOSE GREASE GP-135

Synthetic grease formed by the addition of lithium soap to a polyalkylene glycol derivative. Has outstanding property of a sufficiently low swelling action to permit its use in the presence of rubber under normal conditions. Dropping pt., 375°F.; consistency, NLGI No. 2; water absorption 10%; bleeding (wire cone), 2.1% loss (50 hrs. @ 100°C.); operating range, —55 to 250°F. Uses: General purpose grease. Available in commercial quantities. Carbide and Carbon Chemicals Div.
* Trademark

"UCON"* HIGH-TEMPERATURE GREASE—HT-1256-A

Synthetic grease formed by the addition of lithium soap to a polyalkylene glycol derivative. Characterized by extremely high dropping pt. and exceptionally good stability when used at high temp. Dropping pt., 402°F.; consistency, NLGI No. 2; water absorption, 20%; bleeding (wire cone), 0.2% loss (50 hrs. @ 170°C.); operating range, 15 to 300°F. Uses: High temp. grease. Available in commercial quantities. Carbide and Carbon Chemicals Div.
* Trademark

"UCON"* HIGH-TEMPERATURE GREASE—SLB-400-A-10

A synthetic grease prepared by the addition of finely divided silica to a polyalkylene glycol derivative. Extremely stable gel structure, excellent high temp. properties, good lub. characteristics. Dropping pt., >500°F.; consistency, NLGI No. 2; water absorption, 85%; bleeding (wire cone), 3.9% loss (50 hrs. @ 170°C.); operating range to 325°F. Uses: Certain types of high temp. service. Available in commercial quantities. Carbide and Carbon Chemicals Div.
* Trademark

"UCON"* LOW TEMPERATURE GREASE 818

A synthetic grease formed by the addition of Li-soap to a polyalkylene glycol derivative. Characterized by excellent stability, low volatility, and low bleeding losses. Dropping pt., 365°F.; consistency, NLGI No. 2; water absorption, 30%; bleeding (wire cone), 1.34% loss (50 hrs. @ 100°C.); operating range, —90 to 250°F. Uses: Primarily intended for use in aircraft control bearings, small electric motors, and similar types of equipment operated at extremely low temp. Has been successfully utilized at temp. as high as 250°F. Available in commercial quantities. Carbide and Carbon Chemicals Div.
* Trademark

"UCON"* LUBRICANT 75-H-150,000

A water-sol. polyalkylene glycol lub. having the extremely high viscosity of 150,000 S.U.S. @ 100°F. Also sol. in various organic solvents. Suggested uses: Special lub. applications where its very high visc. is desirable. Available in semi-commercial quantities. Carbide and Carbon Chemicals Div.
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*Trade-Mark

"UCON"® LUBRICANT DLB-65-B

A polyalkylene glycol derivative characterized by a high visc. index, low pour pt. and good anti-wear characteristics. Quite sol. in hydrocarbons; viscosity, 3.23 centistokes @ 210°F., 11.75 (65 S.U.S.) @ 100°F., 190 @ 0°F., 1,950 @ —40°F., and 11,000 @ —60°F.; Viscosity Index, 162; pour pt., below —65°F.; fire pt., 425°F.; Sp. G., 0.951 @ 20/20°C. Suggested uses: Low temp. hydraulic fluids and lub. Available in semi-commercial quantities. Carbide and Carbon Chemicals Div.

*Trade-Mark

"UCON"® LUBRICANT DLB-100-B

A polyalkylene glycol derivative with a very high visc. index which permits the use of non-additive fluids conforming to the viscosity-temp. requirements of several specialized applications. Pronounced anti-wear characteristics and quite soluble in hydrocarbons. Viscosity, 5.3 centistokes @ 210°F., 21.0 (102 S.U.S.) @ 100°F., 410 @ 0°F., 4,850 @ —40°F.; Viscosity Index, 180; pour pt., below —65°F.; flash pt. (Open Cup), 420°F.; fire pt., 540°F.; Sp. G., 0.960 @ 20/20°C. Suggested uses: Low temp. hydraulic fluids and lubricants. Available in semi-commercial quantities. Carbide and Carbon Chemicals Div.

*Trade-Mark

"UCON"® LUBRICANT DLB-130-BX

A polyalkylene glycol derivative synthetic lub. with an oxidation inhibitor added; good anti-wear properties; viscosity, 6.5 centistokes @ 210°F., 28.4 (134 S.U.S.) @ 100°F.; 750 @ 0°F., 13,000 @ —40°F.; Viscosity Index, 167; pour pt., below —65°F.; flash pt. (Open Cup), 485°F.; fire pt., 535°F.; Sp. G., 0.970 @ 20/20°C. Suggested uses: Low temp. hydraulic fluids and lubricants. Available in semi-commercial quantities. Carbide and Carbon Chemicals Div.

*Trade-Mark

"UCON"® WATER-SOLUBLE GREASE WS-400

A synthetic grease prepared from a soda soap and a water-sol. polyalkylene glycol derivative lub. Completely dispersible in aq. solution. Dropping pt., 324°F.; consistency, NLGI No. 2; bleeding (wire cone), 2.3% loss (50 hrs. @ 100°C.). Uses: Special applications where a water-sol. grease is required. Available in commercial quantities. Carbide and Carbon Chemicals Div.

*Trade-Mark

"UCON"® WATER-SOLUBLE WOOL LUBRICANT H-15

This water-sol. synthetic fiber lubricant is easy to apply, allows complete removal with min. scouring, eliminates back-washing prior to dyeing, does not become gummy or develop hard-to-remove oxidation products even after exposure to high temp. Viscosity (S.U.S.), 235 @ 210°F., 150 @ 100°F., 3370 @ 70°F.; pour pt., —58°F.; Sp. G., 1.060 @ 20/20°C.; sol. in water, complete @ 100°F. Uses: Lub. for wool processing, amount needed is only 2% of the weight of the wool (60-80% less than with conventional oils). Exptl. runs show 80-90% reduction of ends down in spinning and 18% reduction in card strippings. Available in commercial quantities. Carbide and Carbon Chemicals Div.

*Trade-Mark

"UCON"® WATER-SOLUBLE WORSTED LUBRICANT H-6

Water-sol. synthetic fiber lub., eliminates "resists" and back-washing prior to dyeing, easily removed with min. scouring, and easy to apply from water sol. Sol. in water, complete @ 100°F.; viscosity (S.U.S.), 110 @ 210°F., 665 @ 100°F., 1,570 @ 70°F.; pour pt., —40°F.; Sp. G., 1.065 @ 20/20°C. Uses: Lubricant for worsted processing. Only 1-3% of the fiber weight gives excellent tops of long fiber and beautiful spinning qualities. Available in commercial quantities. Carbide and Carbon Chemicals Div.

*Trade-Mark

UFORMITE 435

A stable, liquid urea formaldehyde adhesive for wood. Solids range, 40% (P.M.M.A.); viscosity (Gardner-Holdt), C to E @ 25°C.; pH, 8.0 to 8.5. Used in wood bonding especially suited to bulk shipment and storage. Availability: Plant-scale. Rohm & Haas Co., The Resinous Products Div.

UFORMITE 471

A 40% aq. solution of a modified urea formaldehyde resin. pH, 7.5 to 8.5; clear, colorless-to-pale yellow liquid; water dilutibility, infinite. Used to produce wet strength in sulfite, rag, groundwood, and bleached kraft papers. Availability: Plant-scale. Rohm & Haas Co., The Resinous Products Div.

UFORMITE JS-508

A urea formaldehyde resin adhesive for wood; a tan, dust-free powder containing catalyst and lubricating agent. Used in tapeless splicing of veneers by jointer or by splicer, in dielectric bonding of heavy veneers and of lumber cores up to ½" thick. Availability: Plant scale. Rohm & Haas Co., The Resinous Products Div.

VPI® 220 and VPI® 260

Volatile corrosion inhibitors; crystalline cpds. which vaporize slowly. "VPI" vapors prevent corrosion of steel by air and moisture; does not react with moisture or O_2. The protective action is prolonged by use of a barrier such as wrapping paper ("VPI"-coated) to prevent free circulation of air. NO_2 (min.): VPI 220, 30%; VPI 260, 19.5%. VPI (min.): VPI 220, 96%; VPI 260, 98%. pH (1% aq. sol'n.): VPI 220, 7%; VPI 260, 7.5%. $NaNO_2$ (as sulfate ash; max.): VPI 220, 2.0%; VPI 260, 1.0%. Turbidity on dilution (to 2% with dist. H_2O): none for either. Shell Chemical Corp.

*Trademark

XYNO DRAWING COMPOUND #200

A drawing and cold rolling compound for ferrous and non-ferrous metals. Non-corrosive, rust inhibiting, and free cleaning. Permits deep draw. Availability: Commercial. Onyx Oil & Chemical Co.

XYNO RESIN 203

An aq. dispersion of a vinyl copolymer which imparts to leather a flexible, lustrous coating. Availability: Commercial. Onyx Oil & Chemical Co.

XYNO RESIN X-99

An aq. dispersion of a thermoplastic resin which imparts firmness and excellent stiffness to textile fabrics. Availability: Commercial. Onyx Oil & Chemical Co.

XYNOBRITE 1344

A clear, viscous, highly alkaline liquid possessing unusual wetting and detergent properties. Primarily a non-foaming detergent. Stable in hard waters. Used for mechanical and automatic dish washing. Availability: Semi-commercial. Onyx Oil & Chemical Co.

XYNOFIX FL

A direct dye fixative which improves the fastness of colors to washing, perspiration, wet-ironing and wet-processing, and prevents bleeding in cross-dyeing and printing. Availability: Commercial. Onyx Oil & Chemical Co.

XYNOMINE 91

Sodium salt of a sulfonated fatty acid amide; amber powder; approx. 20% active material, sol. in water; active ingredient sol. in alcohol; compatible with dilute acids and alkalies and in hard water. Detergent and foaming agent. Used in commercial and industrial cleaning compounds. Availability: Commercial. Onyx Oil & Chemical Co.

COMPANY ADDRESSES

Advance Solvents & Chemical Corp., 245 Fifth Avenue, New York 16, N. Y.

Amend Drug & Chemical Co., 117-119 East 24th Street, New York 10, N. Y.

Alrose Chemical Co., Box 1294, Providence, R. I.

American-British Chemical Supplies, Inc., Kay-Fries Chemicals, Inc., 180 Madison Avenue, New York 16, N. Y.

American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N. Y.

American Polymer Corp., 101 Foster St., Peabody, Mass.

Atlas Powder Company, Wilmington 99, Del.

American Resinous Chemicals Corp., 103 Foster St., Peabody, Mass.

The Baker Castor Oil Company, 120 Broadway, New York 5, N. Y.

Calco Chemical Div., American Cyanamid Co., Bound Brook, N. J.

Carbide and Carbon Chemicals Div., 30 East 42nd Street, New York 17, N. Y.

Chemo Puro Manufacturing Corp., 26-32 Skillman Avenue, Long Island City 1, N. Y.

City Chemical Corporation, 132 West 22nd Street, New York 11, N. Y.

Commercial Solvents Corporation, Terre Haute, Ind.

Demo Laboratories, 8 West End Avenue, Bogota, N. J.

The Dow Chemical Co., Midland, Mich.

E. I. du Pont de Nemours & Co., Wilmington 98, Del.

The Edwal Laboratories, Inc., Ringwood, Ill.

Fritzsche Brothers, Inc., 76 Ninth Ave., New York 11, N. Y.

General Biochemicals, Inc., Laboratory Park, Chagrin Falls, Ohio

General Mills, Inc., 2010 E. Hennepin Ave., Minneapolis 13, Minn.

Glyco Products Co., Inc., 26 Court Street, Brooklyn 2, N. Y.

Halogen Chemicals, Inc., 616 King Street, Columbia 5, S. C.

Harwick Standard Chemical Co., 60 South Seiberling Street, Akron 5, Ohio

Hercules Powder Company, Inc., Wilmington, Del.

Heyden Chemical Corp., 393 Seventh Ave., New York, N. Y.

Hooker Electrochemical Compny, Niagara Falls, N. Y.

E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

Jefferson Chemical Co., Inc., 711 Fifth Avenue, New York 22, N. Y.

Kessler Chemical Co., Inc., State Rd. & Cottman Ave., Philadelphia 35, Pa.

Koppers Co., Inc., Pittsburgh 19, Pa.

Lucidol Division, Novadel-Agene Corp., 1740 Military Rd., Buffalo 5, N. Y.

Mallinckrodt Chemical Works, St. Louis 7, Mo.

Mathieson Chemical Corp., Baltimore 3, Md.

Metal Hydrides, Inc., 12-24 Congress St., Beverly, Mass.

Michigan Chemical Corp., Saint Louis, Michigan

Monsanto Chemical Co., St. Louis 4, Missouri

National Aniline Div., Allied Chemical & Dye Corp., 40 Rector St., New York, N. Y.

National Distillers Chemical Corp., 120 Broadway, New York, N. Y.

The Neville Company, Pittsburgh 25, Pa.

Nopco Chemical Co., Harrison, N. J.

Ohio-Apex, Inc., Nitro, W. Va.

Onyx Oil & Chemical Co., Warren and Morris Sts., Jersey City 2, N. J.

Paisley Products, Inc., 1770 Canalport Ave., Chicago 16, Ill.

Pennsylvania Salt Manufacturing Co., 1000 Widener Bldg., Philadelphia 7, Pa.

Phillips Petroleum Co., Bartlesville, Okla.

The Quaker Oats Co., Merchandise Martz Plaza, Chicago 54, Ill.

Reichhold Chemicals, Inc., 601-707 Woodward Hts. Blvd., Detroit, Mich.

Rohm & Haas Company, Washington Square, Philadelphia 5, Pa.

Sharples Chemicals, Inc., 123 South Broad Street, Philadelphia 9, Pa.

Shell Chemical Corp., 50 West 50th Street, New York 20, N. Y.

Stauffer Chemical Co., 420 Lexington Ave., New York 17, N. Y.

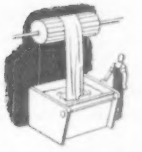
U. S. Industrial Chemicals, Inc., 60 East 42nd Street, New York 17, N. Y.

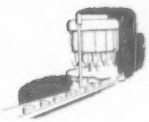
Victor Chemical Works, 141 West Jackson Blvd., Chicago 4, Illinois

Winthrop-Stearns, Inc., Special Chemicals Div., 1450 Broadway, New York 18, N. Y.

Wyandotte Chemicals Corp., Wyandotte, Mich.

How can B&A ALUMINUM CHLORIDE SOLUTION Help you?





When your research or production programs indicate need for an inexpensive, water-soluble aluminum compound, investigate the advantages of B&A Aluminum Chloride Solution. As a raw material or treating agent, it may prove the key to your process problems, particularly those requiring a material low in iron, arsenic, and heavy metals.

This superior B&A Fine Chemical is notable for its clarity and high purity. It is readily available as a 32° Baume solution, containing not less than 50.3% $AlCl_3 \cdot 6H_2O$. Its quality and uniformity are maintained through rigid laboratory control during production . . . your assurance of another B&A Fine Chemical made to meet the most exacting requirements.

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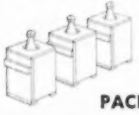
- As a carbonizing agent for wool
- As a hardening ingredient of photographic fixing baths
- For purification of glycerine by-product of soap manufacture
- In the preparation of color lakes
- As a raw material in the manufacture of aluminum hydroxide and other basic aluminum compounds



PACKAGING

B&A Aluminum Chloride Solution is readily available for shipment from convenient shipping points in—

Carboys . . . Net weight 135 lbs.

Tank Cars . . . Net weight 21-42 tons, approx.

BAKER & ADAMSON *Fine Chemicals*

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

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Offices: Albany • Atlanta • Baltimore* • Birmingham* • Boston • Bridgeport* • Buffalo* • Charlotte* Chicago* • Cleveland* • Denver* • Detroit* • Houston* • Jacksonville • Los Angeles* • Minneapolis New York* • Philadelphia* • Pittsburgh* • Providence* • St. Louis* • San Francisco* Seattle • Yakima (Wash.)

In Wisconsin: General Chemical Company, Inc., Milwaukee, Wis.

In Canada: The Nichols Chemical Company, Limited • Montreal* • Toronto* • Vancouver*

SETTING THE PACE IN CHEMICAL PURITY SINCE 1882

* Complete stocks are carried here.

New Equipment for Industry

6th Annual Survey of NEW CHEMICALS and NEW EQUIPMENT

INDEX

Adsorbers	275	*Heat Exchange*	274
Auxiliaries	282	*Instrumentation*	284
Centrifuges	278	*Materials Handling*	279
Crystallizers	279	*Mixers*	275
Distillation, Absorption and Extraction	274	*Pipe and Fittings*	282
Dryers and Humidifiers	280	*Pumps, Compressors and Expanders*	276
Dust Separators	280	*Safety*	278
Evaporators	280	*Solid Separation*	280

Addresses of manufacturers listed in this section will be found on page 290.

DISTILLATION, ABSORPTION, AND EXTRACTION—New Equipment Announced 1949-50

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*		*Company*
Centrif. solvent extraction unit	10-15 stages	316 stainless steel	Lab. model; equilib. reached in few minutes		100-500 cc per min.	Podbielniak, Inc.
Fractionating and gas absorption tray	28" dia. up	All	Flat type tray with high capacity range	Fractionation of chemicals and petrol.		Koch Engr. Co.
Hydrogenator	50 gals. and up	All weldable materials	Contour-fitted baffles line-bored drive tower with 2 extl. bearings; tapered agitator shaft	For slow rate gas-liquid reactions requiring suspension of solid catalyst	Modifications can be made	Industrial Process Engr.
Low P-drop vacuum tray	28" dia. up	All	Very low P-drop with all the benefits of original Kaskade	Vac. distillation or where low P-drop is important		Koch Engr. Co.

EVAPORATORS—New Equipment Announced 1949-50

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*		*Company*
Evaporator	600-12,000 lbs. per hr.	Mild or Cu-bearing steel; stainless steel	Inner, horizontal cylinder; low speed rotor; short treating time; large surface area	Heat-sensitive material; continuous, non-fouling evaporation	75-100 psi steam	Bowen Engr., Inc.
Evaporators	Single, multiple effect	All weldable alloys	Flat plate heating surface, no tubes; liquid and vapor pass channel switching system self-cleans all eqpt. offouling	For evap. where scale is deposited; pulp mills, etc.		General Amer. Transport. Corp.
Evaporators	1.5-5 million BTU/hr	Mild or stainless steel and alloys; Monel; graphite burner	Submerged combustion with oil burning eqpt.	Difficult evaporations where gaseous fuels not available; requires fuel oil with max. distill. end pt. 550° F		Ozark-Mahoning Co.
Submerged combust. evaporator	0.15-24 million BTU/hr	Mild or stainless steel and alloys; Monel	Water and/or air jacketed burners	Evap. and concentration of organic sol'ns. which decompose with reglar subm. comb. burners	Lowest operating T: 140° F	Ozark-Mahoning Co.

HEAT EXCHANGE—New Equipment Announced 1949-50

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*		*Company*
Automatic self-cleaning heat exchanger	100-700 gpm	As specified	Automatically removes fouling material from tubes; no. of cleanings/hr. can be varied	For liquids carrying solids that settle on tubes; oils, waxes close to solidifying point		Davis Engr. Corp.
Concentric tube heat exchanger	1" I.D.x9' tubes	"Karbate" tube and shell	Sectional construction to meet capacity reqrmts.; suited for low flow rates; high heat transfer rate; thermal shock resistant; corrosive fluid in tube and in shell	For heat exchange between 2 corrosive streams	340 F; 50 lbs. steam; 75 lbs. hydrostatic	National Carbon Div., UCC
Concentric tube heat exchanger	1 or 1.5" I.D.x9' tubes	"Karbate" tubes, steel shell	Sectional construction to meet capacity reqrmts.; suited for low flow rates; high heat transfer rate; thermal shock resistant	For liquids and gases	340 F; 50 lbs. steam; 75 lbs. hydrostatic	National Carbon Div., UCC
Coolers		Steel, Al; stainless steel; others	Circulates air at controlled velocity; in or external air cooling; material-entry in roof; 2 rotating parts	For cooling hot solids		Wyssmont Co.

HEAT EXCHANGE—New Equipment Announced 1949-50 (Continued)

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Cooling tower	3-60 tons or 9-200 gpm	Steel	Compact; completely assembled; quiet; open distribution basin	Air conditioning; refrig.; process cooling		The Marley Co., Inc.
DriCooler	All	Steel; asbestos board covered redwood	Forced or induced draft; horizontal or vertical; press. bonded fins on tubes	Jacket water cooling; high level process cooling		The Marley Co., Inc.
Heat exchanger	Various	Cu	Removable tube bundle; large transfer surface			Ross Heater & Mfg. Co.
Heat exchanger	Compl. range	Stainless steel	Standardization of all parts; no contamination or corrosion		Tested to 450 psi	Ross Heater & Mfg. Co., Inc.
Heaters	Any height or dia.	Low carbon or stainless steel; Ni; Monel, etc.	Fintubes; single or multiple circular banks; 8-10 times heating surface of plain pipe	Process heating		Brown Fintube Co.
Packaged liquid cooler	5-100 daily tons refgr.	As specified	Installed in 24 hrs; shell and tube lqd. cooler and condens.; specifically designed; shop assembled	For operations above —80 F		Doyle & Roth Mfg. Co.
Shell and tube heat exchanger	0.875″ I.D. x 9′ tubes 10″ std. pipe shell 1, 2, or 4 pass	"Karbate" impervious graphite, steel shell	Larger std. unit; corrosion resistant; compact; easy tube replcmt.; high heat transfer rate; thermal shock resistant	For corrosive liquids and gases	340 F; 50 lbs. steam; 75 lbs. hydrostatic	National Carbon Div., UCC

MIXERS—New Equipment Announced 1949-50

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Agitator	1-50 HP		Variable speed from 15 rpm up; fluid motor; flexible; convenient, safe		Headroom not above 24″	Emerson-Scheuring Tank & Mfg. Co., Inc.
Agitator			Heavy-duty; easily moved and inserted; 2 integral baffles; turbine type	Batch mixing and blending lqds. in up to 40 tanks		Mixing Eqpt. Co., Inc.
Agitator for conical bott. tanks	Any	All weldable metals	Curved turbine in straight section and pitched plow in cone; no step bearing reqd.	For conical bott. tank mixing of 2 or more phases		Industrial Process Engrs.
Air-powered mixer	10 and 20 gal.; specials		Non-sparking, discharge under press. while beater turns; jacketed	Flammable or explosive material	30-125 psi air	Union Tool Corp.
Blender	1-300 ft.³		Rotary, V-shaped; twin shells; 2 end-covers; discharge valve at apex; easy cleaning; no baffles	For dry powders		Patterson-Kelley Co., Inc.
Continuous mixer	Variable throughput	Stainless steel	Sanitary; completely enclosed mixing chamber; high throughput; liquid shear principle	Rubber, baking, dairy, mayonnaise and paint industries	Material must be pumpable	American Machine & Fdy. Co.
Fibre Drum Tumbler or Rollers	All sizes	Steel and C. I.		For mixing thermoplastic powders in fibre drums		The Vol-U-Meter Co.
High shear agitator	Any	All weldable materials	Stator ring with baffles surrounding shrouded curved-blade turbine; assembly shaped to contour of kettle bottom	Dispersing and dissolving, liq.-liq.; liq.-sol., liq.-gas; high rate of heat transfer from kettle bottom		Industrial Process Engrs.
Homogenizer	1000 gph at 5000 psi	To suit application	"O" ring head gaskets single "V" type plunger packing; 3 distinct phases of homogenization	Homogenizing chemicals, pharmaceuticals, etc.		American-Marsh Pumps, Inc.
Mixer	200-12,000 rpm	302 stainless steel	2 concentric counter-rotating propellers; little cavitation; no centrif. effect; constant liqd. level	Mixing heavy particles		Brookfield Engr. Labs., Inc.
Mixers	0.25-350 gal. and larger	Iron; plain, Cr-plated or stainless steel	Rapid mixing; rapid, controlled bottom discharge; easy loading and cleaning	For mixing dry powders; pastes; tough rubbery masses		Evarts G. Loomis Co.
Mixer	50-200 lbs.	Stainless steel	All welded; push button control; safety mechanism; special steel shaft to eliminate product contamination	Mixing and blending of chemicals and pharmaceutical products		F. J. Stokes Machine Co.
Mixing and kneading machine			Double arm type; lower charging level; unlimited unloading positions	Masticating, dispersing rubber, plastics, etc.		H. W. North Co.
Open tilted Turbo-mixer	To suit	Steel; stainless steel; etc.	200 and 300 HP input; large vessel construction	Chem. reactions; aerobic fermentations		Turbo-Mixer Corp.
Serum colloid mill	1.5, 2, 5 HP	Stainless steel, types 304 and 316	Cutting blades in hopper; 10,000-12,000 rpm; "O" ring water cooling; completely jacketed hopper	Serums; vaccines; biological preps.		Eppenbach, Inc.
Side entering mixer	5-30 HP	Steel, bronze, stainless steel, monel	Outboard sealing ring allows stuffing box to be repacked without draining liqd. from tank	Gasol. blending and chem. processing tanks in continual use	For liquids only	Eastern Industries, Inc.
Side-entering mixer	2 models	Various	Fabricated rather than cast for economy; self-sealing shaft permits repacking without draining or loss	Chem. and processing		H. K. Porter Co., Inc.
Vacuum mixing eqpt.	5-350 gal.	Stainless steel, types 304 and 316	Teflon seals and stuffing box; flush type valves with Teflon seats	Mfg. of cosmetics, pharmaceuticals, etc.	Vac. up to 29″ Hg	Eppenbach, Inc.

ADSORBERS—New Equipment Announced 1949-50

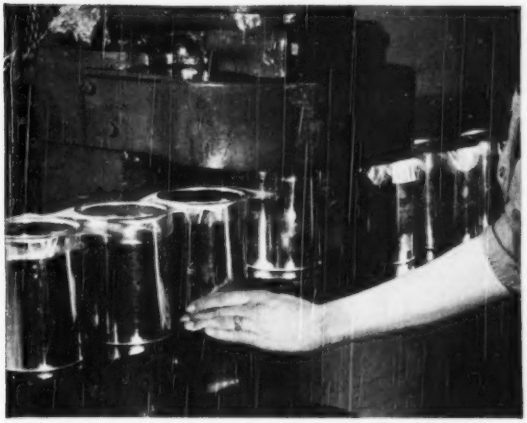
Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Deionizers	Any size	Corrosion resistant tanks	High capacity	Boiler feed-water and process water deionization		Elgin Softener Corp.
Instrument air dryer	75-2,000 lbs. H_2O remvd. per day		Fully automatic; more efficient use of adsorbent	Refinery air supply; combustion control eqpt.	Dewpt. to —30° F reactivat. by steam or electric	Pittsburgh Lectodryer Corp.
Mixed-bed de-ionizers	15-1,000 gph. std.; larger, special	Rubber lined tank, valves, pipes; polystyrene exchanger	De-ionization in single column containing both cation and anion exchanger	For production of silica-free CO_2 free H_2O with resistance above 1 megohm		Illinois Water Treatment Co.

PUMPS, COMPRESSORS, AND EXPANDERS—New Equipment Announced 1949-50

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*		*Company*
Air-operated pump	1.0-1.5 gpm oil		Continuous acting; reciprocating valve	1,000 psi, oil W. P. from 90 psi air; also higher; 0.75 ft.³/stroke; uses 3.5 cfm air at 90 psi		Lyon-Raymond Corp.
Air-powered pumps	2 cc/stroke to 405 gph	Any metal that can be cast and machined; plastics	Liquid ends powered by reciprocating air cylinders	Hydrostatic testing; blending; formulating; sampling; proport. feeding	Max. P =25,000 psi	Milton Roy Co.
Induced draft bifurcators	To 36″ dia. and 65,000 lbs. flue gas/hr.	Std. or stainless steel	Installed in any position as sect. of breeching or stack; year round positive draft control; no bearings (except motor) or belt	For very high temp. application		DeBothezat Fan Div., Amer. Mach. & Metals, Inc.
Blowers	100-15,000 cfm		Highspeed; lends itself to direct drives	Positive displacement blowing	To 20 psi	Standard Stoker Co., Inc.
Centrifugal process pump	1-4″	To suit application	Adjustable rotor; prelubricated bearings; open or closed impeller	General purpose pump	15-600 gpm.	De Laval Steam Turbine Co.
Centrifugal pumps		Ilium	Semi-open non-clog type impeller; readily cleaned	For pilot plant or lab.	To 3600 rpm	Burgess-Parr Co.
Centrifugal pump	8 sizes: 1-3″	Stainless steel: No. 316 and FA20	Semi-open impellers; adjustable for wear	Heavy duty corrosive liquid pumping		Goulds Pumps, Inc.
Centrifugal pump	5 sizes: 0.75-5″		Cradle mounted; various drives	Capacities to 1600 gpm, heads to 250′; 0.25-75 HP		Ingersoll-Rand Co.
Centrifugal pump	1-4″		Vertical or horizontal position; enclosed-type impeller; splash protected motors	For installations with flooded suctions	10-10,000 gpm	Marlow Pumps
Chem. proportioning pumps	To 330 gph	Ceramic wet-end parts, Teflon gaskets	New head construction	All concentrations of all acids, metal salts, etc.	No HF, no strong caustic	Lapp Insulator Co., Inc.
Compressor	220-880 and 1100-2200 BHP	Iron and steel	High compression; more HP in same space	For heavy duty compressor work	Needs natural low butane gas	Clark Bros. Co., Inc.
Compressor	To 6,000 psi	Steel or non-corrosives	Semi-portable; 4-stages; all parts accessible	For pilot plant or lab.	1-3 cfm	Norwalk Co., Inc.
Engine-driven diaphragm pumps	3″, 4″ models	Various	For very heavy liqds., thick residues; will not readily air-bind; suction lifts to 20′; 3000-9000 gph			Marlow Pumps
Gaskets		Teflon	Cone-type rings; sealing action partly from flexing of cones	Stuffing boxes exposed to chem. attack		U. S. Gasket Co.
Gearless pump	0.25, 0.375, 0.5, 0.75″ ports		Close-coupled electric motor driven; simple installat.; resilient mounted; automatic therrial overload relay	For pumping from circulation work to duty against 150 psi		Eco Engr. Co.
Pump	6-18″	Std. or special materials	Ease of installation; small floor space reqd.; low NPSH reqd.	Line booster in refinery and process work; barge unloading; water service		Peerless Pump Div., Food Machinery & Chem. Corp.
Jet pump	2″ from stock		2-part cycle; no moving parts other than valves	Lifts by suction, discharge against heads nearly equal to gas, air or steam press. used		Penberthy Injector Co.
Inducto-Jet	Unlmtd. and custom built	Brass; stainless steel	Vacuums to 0.5″ Hg using 25 lbs. jet	Evacuating; mixing; aerating		Whittington Pump & Engr. Corp.
"Karbate" pump with Teflon packing	3 sizes		Better, more corrosion resistant seal	For corrosive liquids	340° F	National Carbon Div., UCC
L-P gas pumps	5, 10, 20, 30, 55 gpm power pumps; 12 revs. a gal. hand driven	All iron and bronze fitted	Non-lub. type bearings for dry liqds.; metallic packing in extra long stuffing box; treated gaskets	Transferring of all types L-P gas	100 lbs. max. diff. P; 400 lbs. hydrost. P	Viking Pump Co.
Metering pump			Electronic control; solenoid; adjustable stroke length	For metering to 0.8 in.³ per stroke		Eastern Industries, Inc.
Minipump*	0.046 cc/stroke to 3740 cc/hr	Stainless steel	Motor or air powered; simplex or duplex	Pumping clear liquids in minute quantity and precise volume at P to 1,000 psi		Milton Roy Co.
Multistage centrifugal pump		Any machinable alloy	No need for balancing device; ring oiled ball bearings	High pressure processing service; feeder line service	10-800 gpm to 750 psi	American-Marsh Pumps, Inc.
Packing	16 sizes		Self-lubricating; not swell or shrink, easy to install	For inside packed reciprocating pumps	To 450° F	Greene, Tweed & Co.
Shaft & pump packing		Teflon; Teflon-graphite-mica	Non-corroding; non-contaminating	To prevent chem. attack from solvents, acids, alkalies		U. S. Gasket Co.
Plunger pumps	3″, 4″ models	Various	Heavy duty, walking-beam plunger; engine-driven; base mounted; steel wheels; pneum. tires	For very heavy lqds.; thick residues	4200-6500 gph	Marlow Pumps
Porcelain pump	1-4″	High fired porcelain armored with glass cloth and resin	Complete porcelain wet-end; replaceable heads for varying capacity	Processing of corrosive agents	Not for caustic or strong HF	General Ceramics & Steatite Corp.
Proportioning Pumps			Pneumatic instrument control; automatic volume change from 0 to full displacement	Feeding		Lapp Insulator Co., Inc.
Pumps	3.5,10, 20, 30gpm	Stainless steel	Self-priming; manual bypass control			Ertel Engr. Corp.
Pumps	4 models	Plastic or hard rubber body block; rubber lining	"Squeegee" action; self-priming; positive displacement; no glands, stuffing box, or check valve	Handling corrosive liquids; gases	20-180 gph	Vanton Pump Corp.
Pump protector			Audible and light alarm; automatically stops pump	Prevents damage to pumps from running without H_2O		Automatic Control Co.
Rotary pumps		Non-metallic "sliding" vanes	"Sliding" vane enables greater range in type of material to be handled; vanes positively actuated; more quiet and wear resistant	For high and low viscosity lqds.		Blackmer Pump Co.
Rotary pumps			Inboard bearing construction takes load off main bearing	For other than direct drive		Worthington Pump & Mach'y. Corp.
Sanitary pumps	35-1360 gph	Stainless steel	Motor or air powered	Pumping foods, batters, syrups, etc.	To 200 psi	Milton Roy Co.
Screw type rotary pump	5-80 gpm		Mechanical seal; prelubricated bearings	Oil transfer; lubrication; general hydraulic service		De Laval Steam Turbine Co.
High-P seal			Improved control and balance of hydr. press. reduce wear; simple cooling	Variety of liqds. to 600 psi and 250° F		Felt Products Mfg. Co.
Self-priming pump	2 sizes		Corrosion resistant; cuts priming time 66%	Maintains dry vacuum to 28.4″ Hg		Duriron Co., Inc.
Sludge pumps			Crosshead guide assembly secured to each plunger increases efficiency; bronze guide bearings; eliminates misalignment			The Ralph B. Carter Co.
Sludge pumps	4″ and 6″	Various	Eccentric drive plunger; various drives available	For very heavy lqds.; sludges; etc.	3000-14, 400 gph	Marlow Pumps

No matter what your packaging problem

VISQUEEN* film can save you money



"Crown" Can with liner

Wet, Dry, or Hygroscopic . . . there's practically no chemical that can't be shipped cheaper, safer, better in VISQUEEN film!

Ask us about these three packaging methods:

1 Metal container plus VISQUEEN liner = a revolutionary new way to ship liquid corrosives. Safer than ever before because there's *no glass to break.* Cheaper than ever before because savings up to 40% in package weight, savings up to 33% in package size are obtained. Net result: savings up to 66% in shipping costs. Sizes—4 ounces to 55 gallons.

2 Multiwall bag plus VISQUEEN liner = a sure way to save on the shipping of hygroscopics. VISQUEEN film liner locks out moisture, positively prevents lumping and caking of shipped materials. In addition, this type package has excellent filling, storing and stacking qualities. With all its advantages, this new packaging actually costs far less!

3 Fiber drum plus VISQUEEN liner = big savings in tare weight and freight costs. Use this new method with your "trickiest" chemicals—for VISQUEEN film is chemically inert, has high tensile strength, tear resistance and absolute purity. Hygroscopics? Yes! VISQUEEN film is one of the most effective moisture barriers known.

Arkel Safety Bag

Continental "Sta-Pak" Drum

Give us your toughest packaging problem. Our engineers will try to help you whip it. Write us today.

IMPORTANT!

All VISQUEEN film is polyethylene, but not all polyethylene film is VISQUEEN. VISQUEEN is the only film produced by the process covered by U. S. Patent No. 2461975. Only VISQUEEN film has the benefit of the research and extensive technical experience of The Visking Corporation, pioneers in the development of polyethylene film. Be sure. Always specify VISQUEEN film for superior tear and tensile strength and greater uniformity.

VISQUEEN FILM . . . *a product of*

THE VISKING CORPORATION

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PRESTON DIVISION • TERRE HAUTE, INDIANA

THE VISKING CORPORATION, Preston Division
P. O. Box 8Y1410, Terre Haute, Indiana
We'd like to be shown how VISQUEEN film lined containers can save money for us.

Name .....

Company ..... Title .....

Address .....

City ..... Zone ..... State .....

PUMPS, COMPRESSORS, AND EXPANDERS—New Equipment Announced 1949-50 (Continued)

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations	Company
2-stage pump	To 25 gpm; total head 800′		Hydraulically balanced, back to back impellers; labyrinth-type seal; renewable protective shaft sleeve		Warren Steam Pump Co., Inc.
Steam turbine	To 2000 HP, 1450 psi; 950 F.T.T.; 300 psi back press.		All labyrinth shaft seals, separate overspeed trip	Designed for high P, all weather service	De Laval Steam Turbine Co.
Triplex Hi-pressure pump	18 gpm at 5000 psi	To suit application	"O" ring head gaskets; single "V" type plunger packing	High pressure testing; boiler feed; processing	American-Marsh Pumps, Inc.
Turbine-type pump			Sealed in grease ball bearings; no freezing and stalling due to temp. changes	Development of high press. in single stage	Roy E. Roth Co.
Vacuum pump			Oil-diffusion type; clear glass pump barrel; no liqd. cooling; no charcoal trap; no mech. wear	For obtaining vac. of $4x10^{-7}$ mm Hg at 67 liter/sec.	Eitel-McCullough, Inc.

SAFETY—New Equipment Announced 1949-50

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations	Company
Combustion safeguard			Electronic circuit gives absolute safety under all operating conditions	All types of gas fired eqpt.	The Bristol Co.
Combustion safeguard	7 models	Baked enamel housing	Automatic proving and ignition; blue photo cell; time delay for purging	Oil and gas fired ovens; boilers; furnaces, etc.	Wheelco Inst. Co.
Dry chemical fire extinguisher	20 and 30 lbs.	Steel cylinder, stainless steel and brass parts	Quick acting; self contained; easy to use; simple recharging	For class B and C fires	C-O-Two Fire Eqpt. Co.
Dust respirator		Al	U. S. Bur. Mines approved	Pneumoconiosis-producing and nuisance dusts	Pulmosan Safety Equip. Corp.
Fire extinguisher	2.5 gal.	Silicon bronze case	Stronger shell; foam, soda-acid, and anti-freeze H_2O types; UL approved		Amer.-LaFrance-Foamite Corp.
Fire extinguisher	20 and 30 lbs. size		Water tight; dry chemical; new threaded hose connection		Ansul Chem. Co.
Fire extinguisher	500, 1000, 2000 lbs.	Steel tanks	Stationary; dry chemical; N_2-cylinder to pressurize	For effective range of 35′; 450 lbs. per min.	Ansul Chem. Co.
Fire extinguisher		Nilite bronze	Seamless drawn shell; foam or soda-acid; forged collar	Meets UL 500 psi test	The General Detroit Corp.
Fire extinguisher	2.5 gal.	Stainless steel shell	New shell; stronger; 350-500 psi; "Pyrene soda-acid"	For class "A" fires; not approved for flammable liquids or class "C" fires; must not be subjected to freezing temp.	Pyrene Mfg. Co.
Fire extinguisher	2.5 gal.	Steel gas cartridge, stainless steel shell	"Pyrene water type"; CO_2 press. cartridge for expelling content; stronger, stainless shell; 350-500 psi	For class "A" fires; not approved for flammable liquid or class "C" fires; not to be subjected to freezing temps.	Pyrene Mfg. Co.
Fire extinguisher	6 lbs.		UL approved; portable; CO_2	Gasoline fires, etc.	Randolph Labs., Inc.
Gas detector		Steel panel	Underwriters approval; analysis cells placed any distance from panel; samples and analyzes continually; automatic audible and visible alarm and control	For combustible gas detection	Lor-Ann Inst.
Industrial Gloves	One size only		Liquid-tight, exceptional heat resistant	Protection from very hot or cold liqds. For −85 to 314° F	Pioneer Rubber Co.
"Instant-Closing" valve		Rubber-faced valve disc	Automatically shuts off all "hot" lines when control seal is broken; many control pts.	Automatic line control for emergency Low to full-line capacity	McRae Valve Corp.
"Instant-Opening" valve		Rubber-faced valve disc	Control seal operates valve or series of valves; automatically gives deluge of H_2O in emergency	Remote line control	McRae Valve Corp.
Lead dust respirator		Al	U. S. Bur. Mines approved felt filter; new exhaust	Dusts of lead and similar toxicity	Pulmosan Safety Equip. Corp.
Non-spark V-belts	Std.	Special strength members; oil-proof; non-spark rubber	Oil-proof; heat resistant	Where danger of fire or explosion from sparks	Raybestos-Manhattan, Inc.
Protectoglo* relay	11″x13.75″x5″	Relay sheet steel case	Flame failure protection; self-checking "safe start circuit"	Fuel fired combustion systems	Minneapolis-Honeywell Reg. Co.
Respirator	Adjustable		Basic face piece accepts 7 differentcartridges and filters. New port and valve design; new fitting brace; increased visual area	Protection against combination of all dusts, organic vapors, acid gases; NH_3; metal fumes. Must use correct cartridge or filter. Chemical cartridge cannot be used against CO, HCN, or in confined areas having O_2 deficiency	American Optical Co.
Safety goggle	Adjustable		Molded rubber, snug fitting frame; gas tight; rubber adjustable headband; clear plastic replaceable lens		American Optical Co.
SO_2 Analyzer (Thomas Autometer)			Measures air pollution by SO_2; automatic recording	Air pollution surveys 0-5 ppm	Leeds & Northrup Co.

CENTRIFUGES—New Equipment Announced 1949-50

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations	Company
Centrifuge			External control of discharge and consistency; high eff. and capacity	Flocculent suspensions, slimes, other troublesome solids 6,200 times gravity	Sharples Corp.
Continuous centrifuge	20-25 gpm	18-8 stainless and abrasive resist. steels	Continuous classifier with positive control of particle size selection	Classification of pigments, clays, powders, etc.; separation of solids of diff. settling characteristics Separated products are in slurry form	Merco Centrifugal Co.
Ultracentrifuge	1100 ml.		140,000 times gravity force, automatic; vac. and refrig. systems	Lab. research and preparations 40,000 rpm with 160 ml.; 1100 ml. to 20,000 rpm	Specialized Instrument Corp.

CRYSTALLIZERS—New Equipment Announced 1949-50

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Crystallizer extruder	250, 700, 1200, 1800, 3000 lbs./hr		Dual worm extruder combines forming with removal of latent heat; continuous crystallizing and forming	Paraffine and microcrystalline wax	Material must have plastic range betw. molten and solid state	Welding Engrs., Inc.

MATERIALS HANDLING—New Equipment Announced 1949-50

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Bagging scale	1-4 ft.³		Portable; automatic; all electric; flexible dust-tight bin connection; mechanism fully accessible	General bagging; 10-15 discharges/min.; 0.25% accurate		Richardson Scale Co.
Bag flattener	To suit; no std.	Steel	Eliminates air; distributes contents so bags lie flat	Any bagged material that requires flattening		Flexoveyor Mfg. Co.
Barrel truck	For 55 gal. drums, barrels	Steel	Stands alone when not in use	General purpose handling of barrels and drums		Modern Equip. Co., Inc.
Belt conveyor	2 types in 10, 14, 20, 24″ width		Easy to install; starting and stopping rod control at side	Elevating, lowering merchandise	Net lift 12′ at 28 deg. (boxes), 20 deg. (paper bag)	Standard Conveyor Co.
Belt feeder	18-60″ long; 2, 4, 6″ wide		Totally enclosed; fully accessible; continuous stream from intermittent discharge	For controlled stream delivery	To 1500 ft.³/hr.; 0-200 ft./min.	Richardson Scale Co.
Bin feeder			Pulsating panels; pneumatic; range of frequency, force, and amplitude	To solve bin and hopper feed problems		Gerotor May Corp.
Box car unloader	To 40.5′ length		Automatic control; one man operates from outside of car; sweeps	Unloads grain, dry chemicals, sand, etc.	Min. door 5′x7.5′	Stephens-Adamson Mfg. Co.
Chemical feeder	10x5x2″	Acrylic plastic	Compact; self-contained; controls, meters and dispenses	Accurate feeding of corrosive chemicals into larger streams		Fischer & Porter Co.
Chemical feeder		Various	Large capacity; adjustable to 1 gpm per feed; driving mech. in oil-filled case	Capable of pumping against 300 psi/feed		Frontiers Indust., Inc.
Conveyor	10-20′ lengths	61ST6 Al alloy	Light weight; versatile; portable	General purpose, industrial conveying		Belt Corp.
Conveyor belt		Rubber-glass	Heat resistant cover on multiple-ply glass fabric	For conveying hot materials	To 400° F	Lee Rubber & Tire Corp.
Conveyor belt	Std. widths to 24″ 250′ rolls		Solid woven carcass impregnated with neoprene-solvt. cement; rubber coated; moisture resistant	For carton or bag conveying up inclines 30 to 40°		Russel Mfg. Co.
Dock ramp	8′x6′; 10′x6′; 12′x6′	Steel	High press. hydraulic operation	Loading freight cars and trucks	Lift actuated by electric or hand pump, or air press	Revolvator Co.
Drum handler	For std. drum sizes to 100 lbs.	Steel frame	Fast acting; simplified operation; not wider than std. 55 gal. drum	For all types of steel drums	For use with std. Elwell-Parker fork lift trucks	Elwell-Parker Electric Co.
Feeder	Adjustable capacity		Continuous rotary mechanism; infinitely variable speed drive	For steady uninterrupted flow		B. F. Gump Co.
Fork truck	2000, 3000, 4000 lbs.; 48″ long		Wide angle steer; no-plug controller; dynamic braking; Baker Travel motor; worm drive axle; 126″ telescope lift; 63″ free lift			Baker-Raulang Co.
Hand hoist	0.5-4 tons	Steel frame	Steel chain; drop forged hooks; light weight and portable	General purpose; production service where headroom is a factor		American Chain & Cable Co., Inc.
Hydraulic dumpers	Up to 1000 lbs.	Stainless steel, bronze, Ni alloy	Works on normal water press.; no motor or electricity needed	For handling material and dumping into tanks		Consolidated Siphon Supply Co.
Hydraulic materials handler			Mounted on tire caster; large capacity; H_2O-powered	For dumping liquids or solids		Lee Metal Products Co., Inc.
Overhead conveyor		Iron and steel	New type of chain	Light and medium loads		Michna Systems
Platform truck	46″ long platform		Baker reversing controller; intern. spur gear dr.; Baker Travel motor; safety interlock; cushion tires	General purpose		Baker-Raulang Co.
Power truck pallet retriever	For std. fork trucks	Steel	Light; compact; attachable to front of truck; uses pantagraph-type, hydraulically operated ram	For handling all palletized loads		Elwell-Parker Electric Co.
Rayon conveyor belt	As required	Plies of rayon cord in woven Nylon cased in rubber	Higher tensile strength and fibre resilience; troughs easier; can be spliced by conventional methods	For high tension, long-lift applications		Raybestos-Manhattan, Inc.
Screw feeder	4″ dia. screw		Portable; variable speed	To meter dry chemicals from container to kettle	3.9 cfh	Gifford-Wood Co.
Sectional conveyors	Any length; 18, 24, 30, 36″ widths	Steel	Quick, easy assembly by unskilled labor; strong	Wherever belt conveyor is reqd.		Robins Conveyors Div., Hewitt-Robins, Inc.
Steel cable conveyor belt	As required	Cable encased in rubber, surrounded by Homocord fabric	Super tensile strength; troughs easily; spliced by usual methods	For super tension long lift applications		Raybestos-Manhattan, Inc.
Swivel spout	To suit	Stainless steel, etc.	Dust-tight; remote automatic positioning; elect. or pneumatic operation	Delivery from bins, scales, etc.		Richardson Scale Co.
Transporter trucks	Pallet, platform, or cargo; 4000 lbs. cap. lug; 20,000 lbs. towing cap.		1 gal. gas. per ave. 8 hr. shift; fully automatic clutch and transmission; self contained power unit in turret	General plant trucking		Hyster Co.
Vibratory feeder	24-48″ wide; 48-96″ long	Steel	First practical fully mechanical vibrating feeder; low ampere draw.	Wherever vibrating feeder is reqd.		Robins Conveyors Div., Hewitt-Robins, Inc.
Vibrating conveyor	10′ sect.; various widths		Natural frequency; inclines to 10 deg.; coil springs	Hot, abrasive, corrosive, granular, pulverized or lumps	To 100′/min.	Stephens-Adamson Mfg. Co.
Vibratory conveyor	To 120′; 18″ or 24″ width To 200′; 30″ or 36″ width	Steel	Up to 200′ of pan length on 1 vibrator; balanced operation without counterweight	Wherever heavy, hot material must be conveyed		Robins Conveyors Div., Hewitt-Robins, Inc.
Water-bed, steel-belt conveyor	Max. width 31.5″; any length	Stainless steel	Belt contacts trough of circulating water	Cooling or heating liquid or semi-liquid material	Rubber retaining strip max. T = 450F	Sandvik Steel, Inc

DRYERS AND HUMIDIFIERS—New Equipment Announced 1949-50

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Centrifugal dryer			Quick removable screen and wear plates	Continuously handles wet materials to 0.375″ round		McNally Pittsburg Mfg. Corp.
Freeze dryer			Selective absorption of radiant heat; material may be in glass containers or on trays	Heat sensitive materials, even while frozen		Proctor & Schwartz, Inc.
Freeze dryer	20 liters	Stainless steel	Self-contained; Freon refrig. condenser plates	Chem. and bio. research, small scale production		F. J. Stokes Machine Co.
Humidifiers	Evaporates 1 gph	Cu	Requires no compressor, steam pump, duct, or return line	For all industrial requirements		Abbeon Supply Co.
Humidifier	22x26x42″		Heavy duty; high press.; fully adjustable		750 cfm; 110 v. AC	Daffin Mfg. Co.
Humidifying units	1, 2, 3 gal. liqd./hr.		Maintains moisture content within 2%	Atomization of H_2O,chemicals,etc.	6 cfm at 40 psi	Paasche Airbrush Co.
Parallel current rotary dryer	38″ dia.x20′ through 96″ dia. x 50′	Mild or stainless steels; others	Greater evaporation per unit vol.; high or low temp.; simple, efficient automatic controls	Low T drying of chemicals; waste recovery plants; fibrous materials	Will not give low H_2O content; only for particle size carryable in an air stream	Louisville Drying Machine Unit General Amer. Transp. Corp.
Perforated apron conveyor dryer	Large variety	Steel; Al; stainless steel; alloys	Improved air circulation and conveyor construction	Extruded or filtered chemicals		National Drying Machinery Co.
Spray dryer	10′x15′x23′ high		Semi-plant size; easy to assemble and operate; semi-automatic	Moderate production and pilot plant	2-7 ton/day	Bowen Engr., Inc.
Spray dryer	5-25 lbs. per hr.	Stainless steel cyclone or bag	Direct-fired, steam or electr. heated	Research; testing; small quantities	Comp. air	Swenson Evaporator Co.
Vacuum pan dryer	25 gals. and up	All weldable materials	Scraper agitator with no internal bearings; plug discharge valve	Evaporation of solutions and slurries		Industrial Process Engrs.

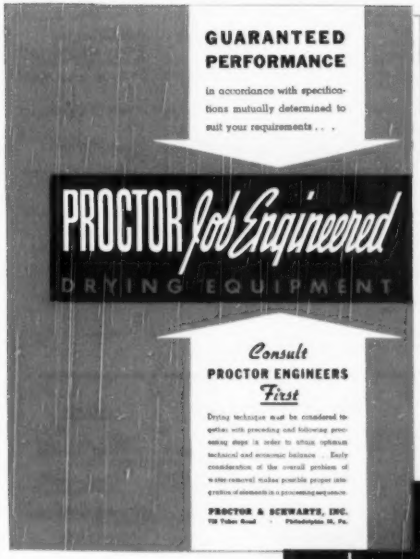
SOLID SEPARATION—New Equipment Announced 1949-50

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
DorrClone® Dutch State Mines Cyclone	3, 6, 12, 24″ dia.	Meehanite	Uses centrifugal force to separate finely-divided solids in liquid suspension	Hydroseparation, micron separation, dewatering of deslimed products in mineral processing	5-100 psi; 5-600 gpm	The Dorr Co.
Ferrous cleaner	18.5x14″; 25.5x14″	Alnico; stainless or cold rolled face	No external power; gravity flow	Separates fine iron from slurries	Installation angle greater than 20	Eriez Mfg. Co.
Filter fabrics		Feon Orlon	Wide range of weaves; easy to clean; non-blinding; long life	Strong mineral acids; solvents; oils; greases		Filtration Engrs., Inc.
Filter frame		Plastic	Resistant to acids and alkalis at high temp.; tough		No deterioration at 300° F	Hercules Filter Corp.
Filters	24-560 ft.	Steel, stainless steel, Monel	Automatic spent cake sluicing; link type spacer bar; individ. leaf discharge; heating jackets	Sugar, chemical and food industry		Enzinger Union Corp.
Filter units	To 10,000 gpm	Monel and Hastelloy "B"	Permits intermittent operation with filter aid and no passage of filter aid even on initial pass	For use with filter aid where operation is not constant		Micro Metallic Corp.
Junior filter pump units	50 gph rated	316 stainless steel pump, lucite filter	Continuous or periodic use; replaceable filter tube; complete unit; 20 lbs. weight	Small quantities, expensive sol'ns. without loss	18 psi head	Sethco
Magnetic separator	From 8″ square openings up	Alnico magnet bars, iron spacers	Grate form; wire grid over grate	Bottom of hopper or floor opening		The Bauer Bros. Co.
Magnetic separator	12, 18, 24″ hopper inlet width	Alnico; stainless or cold rolled face	Separates finer iron than ever before	To remove down to 400 mesh iron from cohesive powders		Eriez Mfg. Co.
Pressure filters	5, 7, and 10 gpm	Stainless steel, bronze, Ni-alloy	Rust proof; corrosion resistant	Purification of any liquid		Consolidated Siphon Supply Co.
Rotary filter	3′ drum dia., 1′ width	Feon nylon cloth; 316 type stainless steel	Interchangeable string or scraper discharge; submergence type washing mech.	Pilot plant continuous filtration		Filtration Engrs., Inc.
Self cleaning filter, encl. tank leaf type, hinged end door	50-1000 ft.^{2}	Steel; stainless steel; Hastelloy; steel, plastic or rubber lined	Spray jet system eliminates removal of filter leaves for cleaning	Removal of suspended matter from aqueous or viscous liquids which become free flowing upon heating		Hercules Filter Corp.
Self-cleaning filter	120-500 ft.^{2} area	Steel; stainless steel; alloys	Automatic sluicing of cake; adjustable, moving spray header	Processing	35 ft.^{2} cake in 15 min. with 700-100 ft.^{3} H_2O	Niagara Filter Corp.
Self cleaning filter	5-3000 gpm	Steel; stainless steel; alloys	Washes away cake without opening filter chamber	Where solids can be washed to waste as slurry		Sparkler Mfg. Co.
Screen		Steel bars	Power operated screen-bar-cleaning mechanism; manual or automatic	Remove trash and large solids from H_2O and sewage		Link-Belt Co.
Stainless steel filters			Controlled porosity or permeability (0-60%); various shapes to suit	Filtering, separating, diffusing, regulating flow of fluids		Amplex Mfg. Co.
Filter units	To specs.	Stainless steel types 304, 347, 316	Large filter area in small unit; low maintenance cost	Filtration of gases, all types of liquids		Micro Metallic Corp.
Tilting filter press			Horizontal or vertical; uniform cake; intermittent filtration does not disturb pre-coat or cake	Usual filtration		T. Shriver & Co., Inc.
Water polishing filters	200, 400 and 1000 gph	Stainless steel, bronze, Ni-alloy	Low cost per gal. material filtered	For small mfg. plants needing low cost eqpt.		Consolidated Siphon Supply Co.

DUST AND LIQUID SEPARATION—New Equipment Announced 1949-50

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Dust collector		Cloth bag	Continuous; constant cleaning of bags; uniform suction; reverse air blast	Collection of fine dusts created by grinding, conveying, packaging, etc.		The W. W. Sly Mfg. Co.
Varnish cooker exhaust collector	Complete range	Hot rolled steel	Dual liquid recirculation	Removal of nuisance from varnish cooking		Claude B. Schneible Co.
Liquid separator	500-1500 gph	Carbon or stainless steel shell	Successive membranes; low P drop; division by sp. gr.	Complete phase separation and recovery of lqds.; emulsions	Emuls. that are stabilized by surf. act. agents not separable	Selas Corp.

Proctor job engineered drying equipment means guaranteed performance



Because of the extensive research and study that precede the recommendation of any Proctor drying system—it is possible for Proctor engineers to guarantee in writing in the sales contract, the performance of that equipment. Always the system is installed under Proctor direction—and must be performing according to contract stipulations before Proctor & Schwartz consider the installation complete. Guaranteed performance means absolute satisfaction. For the story of how Proctor engineers approach a drying problem and an outline of some of the basic types of Proctor equipment for the chemical process industries, write for Bulletin 342–

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Introduction
2 Fundamental explanation of drying
3 How guaranteed performance works
4 Preforming and continuous conveyor drying
5 More on continuous conveyor drying
6 Case histories and typical installations
7 Narrow conveyor dryer; variable circulation laboratory dryer
8 Highlights on other Proctor dryers and summary

AUXILIARIES—New Equipment Announced 1949-50

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Grad-U-Motor* air piston	19″ long, 4.5″ dia.	Cd. finish	Piston type operator giving long stroke and high power	For positioning large dampers; some valves		Minneapolis-Honeywell Reg. Co.
Aspirator	21″	All-steel	Single-disc; adjustable feed sleeve; adjustable speed	To separate light from heavy solids	98–160 rpm	Sprout, Waldron & Co., Inc.
Carbon brick	Straight: 13.5″x6″x3″ and 9″x6″x3″ key: 13.5″x(6-5″)x3″ and 9″x(6-5.375″)x3″	Carbon	Larger sizes permit quicker, more econom. installation, fewer joints	Tank and reactor lining; floors		National Carbon Div., UCC
Chemical motors	0.5-200 HP	All-steel	Pre-lub. bearings	Corrosive service		Westinghouse Elect. Corp.
Cold pipe insulation		Styrofoam	Light-weight; simple covering procedure; highly workable; rigid; high moisture-vapor and decay resistance	For pipes and vessels	1.5 lbs. per ft.³	Robinson Industries
Corrosion testing potentiometer			Range 0-4.1 v. in 12 subdivisions; self contained with battery and galvanometer	Corrosion surveys on pipelines, tanks, etc.		Leeds & Northrup Co.
Graphite combust. chamber and "Karbate" burner nozzles		Graphite and "Karbate"	Long life, no corrosion; min. maintenance; withstands severe thermal shock; burns hot cell gas sat'd. with H_2O to 160° F	For production of HCl gas by burning H_2 and Cl_2		National Carbon Div., UCC
Insulation products	Std. sizes	Mineral wool	Chemically inert; does not disintegrate or cause rust	Insulating blocks to 1700° F; cement to 1800 F and 2300° F		Bigelow-Liptak Corp.
Heat insulation	For all pipe sizes; also flat blocks 1-4″ thick		Increased insulating efficiency; improved mechanical characteristics	For all hot pipes and surfaces 600-1500° F		The Philip Carey Mfg. Co.
85% Magnesia heat insulation	For all pipe sizes; also flat blocks 1-4″ thick		Improved insulating efficiency and water resistance; simplified thickness schedule; lighter weight	For all hot pipes and surfaces up to 550° F		The Philip Carey Mfg. Co.
Magnet	Any width		Stainless steel face plate; completely welded; easy cleaning	Protection against iron in size reduction eqpt.		Sprout, Waldron & Co., Inc.
Molded pipe insulation	Std. sizes to 30″	Glass fibres, thermosetting binder	Canvas cover; roofing felt jacket		800° temp. limit	Owens-Corning Fiberglas Corp.
Package pilot plant	25, 50, 75, 100 gal.	All weldable metals	Completely assembled system with piping, pumps, etc.; vertical column for refluxing or fractionating; total condenser; central control panel	Research and pilot plant for all processes; modifications for spec. requirements can be made		Industrial Process Engrs.
Pneumatic relay	.3.375 dia. x 9″		Method of assembly determines function; totalizing, inverting, etc.	Modifying actions in automatic control circuits	Supply P to 30 psi	Moore Products Co.
Pneumatic relay	0.25″ IPS connections		Sharp cut-off action; high amplifying ratio	Actuates air-electric switches for alarm systems, etc.	10 million cycles	Moore Products Co.
Pressure vessels and pipe	Single plate to 5000 Psi and all pipes	Al-Bronze; single phase, Ampco 8	Approved by ASME Boiler Code Comm.	For corrosive media; high strength; 75000 psi, non-ferrous material	Not good in highly oxidizing or N_2-bearing media	Ampco Metal, Inc.
Reactors	2, 5, 10 gal.	Stainless steel, types 304 and 316	Fit glass-coil heaters; normal atmos. and vac. processing	Research and pilot plant eqpt.		Eppenbach, Inc.
Water softener and coagulator			Cold process slurry type; mixing by hydraul. energy; no submerged mech. moving parts	Water treating		Worthington Pump & Mach'y.

PIPE AND FITTINGS—New Equipment Announced 1949-50

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Coupling	6″ pipe size		Quick disconnect; 40° turn; no tools	Heavy duty	150 psi W. P.	Roylyn, Inc.
Packless expansion joints	3-24″	Cu, stainless steel, other alloys	Longer life with low weight; more compact installation	To absorb expansion or contraction in pipe lines	Standard designs; Cu: 125 psi and 400 F; stainless steel: 300 psi and 1600 F	American District Steam Co.
Excess flow ball check fitting	0.5″	All	Fits into line so that flow is stopped if instrument ruptures	For control instrument lines		Jerguson Gage & Valve Co.
Pipeline expansion			Packless; in-line; corrugated; control rings; maintenance-free	Trenches, tunnels, etc.		Chicago Metal Hose Corp.
Rotating joint	1, 1.5, 2″	Stainless steel balls, Cr and Cd plating	Nothing to tighten or adjust; constant or intermittent service	Steam, hot H_2O, hot oil, brine, etc. etc.	150-300 rpm	Chiksan Co.
Split flange	1, 1.5, 2, 2.5, 3, and 4″	Cast iron	Easier to install; stronger	For connections of "Karbate" to other construction materials		National Carbon Div., UCC
Swivel joint	0.75, 1, 1.25, 1.5, 2″	Stainless steel balls	360 deg. turn 1, 2, or 3 planes; constant or intermittent service; threaded or flanged ends	Steam, other fluids	To 300 psi W. P.; to 600 ° F	Chicksan Co.
Swivel pipe coupling		Metallic seal	Ball bearings; rotates 360° in all planes	Fluids under all press. from vac. to 12,000 psi		Gil-Lair Prod'ts., Inc.
Threaded metal coupling	0.25, 0.5, 0.75, 1″		Simple installation; perfect alignment; no wrenches	Glass-glass and glass-metal connections		Fischer & Porter Co.
Triple-lok tube fittings	0.125-2″ O.D.	Steel; stainless steel	Leak-proof 3 piece flared unit			Parker Appliancee Co.
Tube fittings	For 0.125-1″ O. D. tubes	Monel; brass; Al; steel and stainless types 303 and 316	"Clinch-type"; triple seal; axial support; leakproof	For metal or plastic tubing		Crawford Fitting Co.
PIPE & TUBING						
Air hose	0.25, 0.31, 0.375″ dia.	Rubber cpds.	Oil-proof; 3-ply fabric reinforcement; smooth finish red cover	Air, petrol, solvents, lub. oils	150 and 125 psi W.P.	B. F. Goodrich Co.
Flexible hose	1-2.625″ ID	Stainless No. 20	Fittings can be welded to ends; or ends non flexible for flanges		Various gauges	Carpenter Steel Co.
Glass pipe	1, 1.5, 2, 3, 4, & 6″ I.D.	Pyrex-Brand glass	Heat strengthened ends and all fittings, except U-bends; smaller tolerances than previously	To transport corrosive liquids, foods, etc.		Corning Glass Works
Non-crushing suction hose	1-2″ I.D.; to 50′ lengths	Rubber tube; heavy cotton duck plies; non-metallic spiral reinforc't; rubber cover	Returns to original shape if run over; non-spark	General purpose		Raybestos-Manhattan, Inc.
Oil well drilling hose	2.5, 3, and 3.5″ I.D.	High tensile steel wire	Less bulk; stronger; more flexible; leakless coupling; greater safety	For higher press. of deep wells		Raybestos-Manhattan, Inc.
Plastic tubing		Plastic	Extruded; translucent			Carter Products Corp.

PIPE AND FITTINGS—New Equipment Announced 1949-50 (Continued)

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Porcelain pipe, fittings and valves		High fired porcelain armored with glass cloth and resin	New armoring gives greatly increased strength and safety	Processing of corrosive agents	Not for caustic or strong HF	General Ceramics & Steatite Corp.
Saran-lined pipe	8-36" std. sizes	Steel, Saran rubber 187	Saran lining 0.125" thick or special sizes	Corrosive service	−5 to 167° F	The Michigan Pipe Co.
Steam hose	0.5-1.5" I.D.; to 50' lengths	Rubber; cotton; asbestos and flexible steel braid	Braided wire insert permits pulling, bending, high press. without danger of bursting	For sat'd. steam press. to 200 psi, 380 F		Raybestos-Manhattan, Inc.
Suction and discharge hose	6-14" I.D., to 15' long	1-ply, wire reinforced	Extremely flexible; light weight	Light, loose materials		The B. F. Goodrich Co.
Titanium tubing	0.125-0.75"	99.5% Ti min.	3 std. tempers		Limited availability	The Superior Tube Co.
Welded tube		Stainless steel; type 303	Free-machining			Carpenter Steel Co.
VALVES						
Back press. and relief valve	2 types	Welded, all-steel body	Multi-port; reduced chattering and poor regulation; individual unit setting and repair	Maintain steam press. 0-20 psi		Klipfel Valves, Inc.
Ceramic valve	0.5, 0.75, 1, 1.5, 2, 3"	Merit Ceramic*	9 as hard as diamond; 27,000 psi tensile strength; Teflon seal	For 300 psi to 2000° F	No HF nor hot alkali	Emmett Machine & Mfg., Inc.
Check valves	0.75" and up	Bronze	Lift and swing check, positive seating; 2 side plugs permit removal of disc carrier pin from either side	For 125 psi rated work, close to walls, etc.		The Lunkenheimer Co.
Combin. Vent valve—Flame arrestor	2, 3, 4, and 6"	Al bonnet and arrestor bank, gray cast iron body	Rubber to metal sealing; positive press. relief, vacuum relief; arrestor; arrestor bank quickly removed for cleaning or replacing	For all atm. storage tanks for flammable materials	Max. internal setting 1.75 oz; vacuum 0.5 oz.	Black, Sivalls & Bryson, Inc.
Vent valve	2, 3, 4, 6, 8, 10 and 12"	Al; semi-steel with Al trim or other	Higher flow cap. for greater economy and safety; wider range of press. and vac. settings	Protection of storage tanks and conservation of volatile liquids		Vapor Recovery Systems Co.
Control valve		Various	Positioning of 2 body parts permits angle or straight-through pipe; clean, smooth passage			Annin Co.
Control valve			Adjustable lift-opening lever	To keep flow of 2 fluids in a ratio		Atlas Valve Co.
Diaphragm valve	0.5-4"	Cast iron or steel; Durimet; glass lined	Plastic diaphragm	For corrosive service	To 100 psi, 125 F	Hills-McCanna
Dual valve	36"x8"	Steel	Powered by sep. elec. motors; close control of volume and press.	For operating temp. of 1000° F	150 psi rated	R-S Products Corp.
Forged valves	0.25, 0.375, 0.5"	Carbon, 13% Cr stainless, or 18-8 stainless steel	Fit into limited space; globe or angle; OS & Y	Small lines	Rated 6000 psi at 100° F	Edward Valves, Inc.
Freon relief valve			Consistently seats tightly; tested and accepted by ASME	To prevent Freon leaks	Use rupture disc to counter dirt-lodging leaks	Black, Sivalls & Bryson, Inc.
Gate valves	¼-1"	Bronze with Ni-alloy wedge and seat rings	Union bonnet construction; extra strength	Where valve must be disassembled frequently		American Chain & Cable Co., Inc
Gate valve	0.5-2" with screwed ends 0.5-6" with flanged ends	Cast steel; type 316 stainless	O S & Y; bolted bonnet		150 psi W.P.	Pacific Valves, Inc.
Globe and angle valves	0.75" and up	Bronze	Malleable iron, non-heating hand wheel; solid bronze disc; stems of silicon bronze alloy	125 psi rated P		The Lunkenheimer Co.
Globe and angle valves	0.25-2"	Bronze body; renwbl. stainless steel plug seat and disc	Rugged structure; stronger than conventional valves	All service to 150 lbs. sat. steam; 300 lbs. non-shock cold H_2O, oil, gas	By service ratings only	Manning, Maxwell & Moore, Inc.
High P. needle valves	0.125 and 0.25" pipe size	Brass; steel; stainless body; chrome plated stem	One piece, forged body; tapered point needles	Max. press. to 3000 psi		C. A. Norgren Co.
Jacketed gate, globe, and check valves	1-4"	Monel, Ni, Aloyco 20, stainless types 304 and 316	Jacket to edge of flanges; stuffing box included on bonnets	For handling fluids that solidify or are viscous at room temp.		Alloy Steel Products Co.
Teflon packed "Karbate" valve	1, 2"		Corrosion resistant packing gland	For corrosive liquids	340° F; 50 lbs. steam; 75 lbs. hydrostatic	National Carbon Div., UCC
Needle valve	0.25-1"	Stainless steels, types 304, 316, 347; Monel; Ni; other to spec.	Teflon-seated forged body valves eliminate operating difficulties found in ordinary bar stock valves; outside stem threads; Teflon packing; union bonnets; Teflon renewable seats	For metering corrosive liquids	Max. P = 3000 psi	Alloy Steel Products Co.
Plug valve			Non-lubricated; cylindrical; leak-proof shut-off	Industrial control		Belfield Valve Div., Minneapolis-Honeywell Reg. Co.
Plug valve		Duriron or Durichlor plug, stainless shank; body and gland of Durimet 20	Stuffing box packing is hard, resilient rings and Teflon seal	For corrosive service		Duriron Co., Inc.
Plug gate valves	0.124-0.5"	Stainless steels, types 304, 347, 316; Monel; Ni; other to spec.	Teflon-seated forged body valves eliminate operating difficulties found in ordinary bar stock valves; outside stem threads; Teflon packing; union bonnets; Teflon renewable seats	For metering corrosive liquids	Max. P = 3000 psi	Alloy Steel Products Co.
Relief valve	0.125, 0.25, 0.375, 0.5, 0.75, and 1"	Brass parts, rubber diaphragm	Automatic; diaphragm reinforced with Nylon	Lines carrying air, cold H_2O, oil, insecticides, etc.; 6 relief P ranges to 250 psi		C. A. Norgren Co.
Relief valves			Operating mech. in easily replaced cartridge; simple P adjustment	For 100-5000 psi; −65 to 160° F with only 5% change in characteristics		Pantex Mfg. Corp.
Safety and relief valves			Internal heat exchange steam coil	For handling viscous materials		Farris Engr. Corp.
Safety relief valve			FarriSeal* bellows	To relieve back press. surges to 40% of set point		Farris Engr. Corp.
Safety-relief valve	Various	Stainless steel; steel; brass	New lower blow down ring, self-aligning flat disc; long spring; perfectly aligned nozzle	For press. to 10,000 psi		Farris Engr. Corp.
Sampling valves	0.5-1"	Aloyco 20, stainless types 304 and 316, analyses to spec.	Pipe extensions for obtaining samples away from vessel sidewall; outside stem thread; Teflon packing, gaskets and renewable seats	Sampling of viscous and corrosive liquids from process eqpt.		Alloy Steel Products Co.
Solenoid valves		Non-corrosive	Precision seating; hand-wound, moisture-proof solenoid	Hard-to-handle fluids	AC or DC	Ch. Engelhard, Inc.
Solenoid valve	0.75, 1, 1.25, 1.5, 2"	Cast iron body, bronze piston; all bronze	Dash pot	To eliminate water hammer	To 400° F, 150 psi diff. P.	Johnson Corp.

PIPE AND FITTINGS—New Equipment Announced 1949-50 (Continued)

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Solenoid-operated valve	0.5-2″ screw or flanged; 0.25-3 corrosion res.	Forged steel body, exelloy seat and disc	Rugged; durable; packless; 3 moving parts; 6 v. battery	Oil or oil vapor to gas, etc., to 850° F	1000°F steam, H_2O,	Hoppe Engr. Co.
Velocity-limiting valve	0.25″ pipe size and special	Brass; stainless steel parts	Easily connected to air or gas line; infinite no. of press. calibrations	To limit flow velocity and volume		Pneu-Trol Devices, Inc.
Vent and drain valve	Various	Cast iron body, valve cap, Cu float	Ball-type seat; no disc; automatic; longer life		To 150 psi air; 125 psi H_2O	Crane Co.
Valves	0.25-2″	Forged steel; carbon or Cr-Mo steel	All-purpose; easy repacking; reduced P-drop	Service rated for 600 psi at 850° F		Edward Valves, Inc.
Valves	4″ up		Quickly cleaned without removal from line	Slurries, sludges, gases with solid particles	Max. P-100 psi	W. S. Rockwell Co.
Valves, bronze union bonnet gate	0.25, 0.375, 0.5, 0.75, 1, 1.25, 2, 2.5, 3″	Bronze body; bronze and Cu-Ni alloy trims	Union bonnet with self-centering joint; slip-on type wedge construc., double-disc or solid wedge interchangeable in same body; long life stem material	General purpose where red bronze will be corrosive resistant	Mat. T=550 F; max. P=200 psi	The Ohio Injector Co.
Valves for press. gage connection	0.75x0.5 or 0.5″	All	Reduces std. connections from about 10 to 3	For field mounted press. gages		Jerguson Gage & Valve Co.
Valves; forged OS&Y or inside screw union bonnet gate	0.25, 0.375, 0.5, 0.75, 1, 1.25 and 2″	Carbon steel body, stainless steel trims	Back seating for repacking under press.; stem thread protected from fluids, easily lubricated; extra heavy metal sections; parkerized outside finish; blow-out proof body bonnet joints; free-flowing waterways	High P & T, corrosive, hazardous operations	2000 psi at 100° F; 700 psi at 850° F; 380 psi at 1000° F	The Ohio Injector Co.
NOZZLES						
Nozzle		Brass; stainless steel; Monel	Atomizing nozzle with clean-out needle; pneumatic; spring-release plunger	Orifice clog removal		Spraying Systems Co.
Spray nozzle	0.5-2 gpm; 1.5-4 gpm		Unusually wide angle spray; low flow rates; requires low press; fine, uniform drops	180° umbrella sprays		Bete Fog Nozzle Co.
Spray nozzle	0.25-100 gpm		Shears continuous film from single high velocity jet; uniformly fine particles; various spray patterns	Atomization		Bete Fog Nozzle Co.
MISCELLANEOUS						
Carbon seal			Strong; free from warping or gumming; self-lubricating	For volatile fluids at high P and high shaft speed		Morganite, Inc.
Conservation vent unit	2, 3, 4, 6, 8, 10 and 12″	All Al; semi-steel with Al trim or other	Higher flow cap. for greater economy and safety; wider range of press. and vac. settings	Protection and conservation of volatile and inflammable liquids		Vapor Recovery Systems Co.
All-metal gasket		Ferrous and non-ferrous	Flexible; spiral wound	For high P&T applications		Flexitallic Gasket
Hypermatic* valve lubricant	For 0.5-30″ valves		Automatic; no added mechanical complication; energizable; self-feeding; no over or under lubricating	For plug valve lubrication	Gun or sticks; vac. 50 15,000 psi	Nordstrom Valve Div. Rockwell Mfg. Co.
Liquid ejector	0.5-2.5 gal. per 24 hrs.	Ceramic tubes	Automatic; continuous; acts also as filter	For H_2O and H_2O-oil and dirt removal from comp. air or gas lines		Selas Corp.
Liqd. shock absorbers		Rubber cushion, metal chamber	Can be installed in any position; pulsating cushion	To eliminate shock and hammering in pipe lines		R-S Products Corp.
Plug valve lubricator	0.5-20″		Automatic; forces measured am't lub. into channel; fits any plug valve		Open and close 50-100 times before refill	Delta Engr. Sales Co.
Motor operator for gate valves	4-30″ valves		Operated by H_2O, oil, comp. air or gases; adapt to std. valves	Opening and closing valves	Operating fluid at 40-300 psi	Crane Co.
Packing material	Many molded forms		Chemically inert; flexible	Corrosive service	To 450° F	Crane Packing Co.
Pressure snubber	0.25 or 0.5″ pipelines	Monel	Prevents instrument vibration; filters fluid to gage; no adapting connections req'd.	To cushion press. instrts. against shock	4 porosities	Chemequip Co.
"Karbate" pipe serrater	1, 1.5, 2, 2.5, 3, and 4″	Steel	Simplifies field installation of "Karbate" pipe; easy to use	For field serrating "Karbate" pipe and sizes shown only		National Carbon Div., UCC
Steam traps			New double fulcrum point and venting mechanism increases drainage capacity			Clark Mfg. Co.
Pipe line strainer	3-7500 gpm	Welded steel shell, C.I. cover; basket of stainless steel wire	Easy cleaning of strainer	Full flow protection on lub. systems	To 700 psi	Wm. W. Nugent & Co., Inc.
Twin strainers	To 24″	Meehanite body, steel door, Cu basket	2 strainer chambers in 1 body; no moving parts; low press. drop	To remove foreign matter from liquids at P to 125 and 250 psi		Elliott Co.
"Karbate" pipe threader	1, 1.5, 2, 2.5, 3, and 4″	Steel	Simplifies field installation of "Karbate" pipe; easy to use	For field threading "Karbate" pipe		National Carbon Div., UCC
Triple-lok tube end reducer	0.375-0.25″; 0.5-0.25″; 0.75-0.25″; 0.5-0.375″; 0.75-0.375″; 0.75-0.5″; 1.075″	Steel, brass	Greater flexibility in size reductions	Tubing circuit installations		The Parker Appliance Co.
Valve type sight glass			Removal of observation bowl for cleaning	Observe clarity of transparent liquids under pressure		Worthington Pump & Machinery Corp.

GRINDERS—New Equipment Announced 1949-50

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Angle disintegrator	12″ dia. rotor; to 30 HP	Stainless steel	Quickly and completely demountable for cleaning	For particle size reduction requiring sanitary features		Rietz Mfg. Co.
Crusher-sizer	Takes 10x10″ lumps		Produces 3 sizes; adjustable breakers; anti-friction grease sealed ball bearings	All semi-friable materials, resins, pottery, clay, quartz, etc.	200 lbs./min.	Gifford-Wood Co.
Fluid energy reduction mill			No moving parts; diminished wear and contamination; more uniform size distribution; continuous; sub-micron sizes	For fine grinding integrated with other operations	From sub-zero to 100° F; feed —4 mesh or smaller	C. H. Wheeler Mfg. Co.
High speed stone mills	3, 5, 10, 20, or 40 HP	Steel, iron and stainless steel	Micro adjustment to control product fineness	For processing corrosive formulae; mixing, homogenizing, grinding, dispersing, disintegrating, etc.		Morehouse Industries
Mikro-pulverizer*	8-20 mesh	Cast iron; steel; special metals and alloys	Drum feed; compact; high capacity; no retaining screen	Pharmaceutical field; insecticides; clays; moisture content to 22%	Max. cap. 1ton/hr	Pulverizing Machinery Co.

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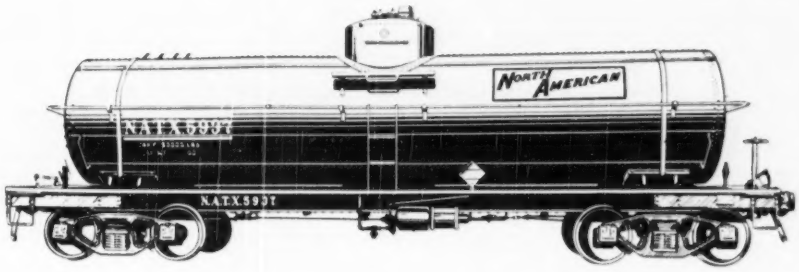

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GRINDERS—New Equipment Announced 1949-50 (Continued)

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations	Company
Oscillating granulator		Stainless steel; cast iron	Increased efficiency; less tendency to wear screens; less product contamination	Particle size reduction of dry or slightly moist chemicals	F. J. Stokes Machine Co.
Roller mills	12"x18" and 18"x24" rolls	Iron and steel	Built-in motor; stainless inlet hopper; new design	General roller mill application	Rietz Mfg. Co.

INSTRUMENTATION AND PROCESS CONTROL—New Equipment Announced 1949-50

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations	Company
Absolute press. recorder and controller			Gives accurate record of vacuum in terms of abs. press., inherently correct for barometric variation; pressure-sealed lever arm; frictionless; free of lost motion	For use under all ordinary plant conditions; 0–6 mm Hg	The Bristol Co.
Air control valve	0.125" pipe size	Corrosion resistant	Compact; quick operating; solenoid; straight or 3-way	For in-line, side, bottom or panel mounting	Ross Operating Valve Co.
Air meter			Hot wire and thermopile principles eliminates air temp. variation error	Measures air velocities; 0-400 or 400-6000 ft/min.	Hastings Inst. Co.
Air-operated control instruments			Only one service adjustment needed; reset rate, derivative time, and proportional bands accurately calibrated and reproducable	Unlimited use for chemical and industrial processes, lab. operation, etc.; can be used with air or water cooling	The Bristol Co.
Air-operated valves	3-12"	Carbon steel; bronze; 316 stainless; plastic; etc.	Great strength; light; compact; accessibility	Process control; To 125 psi line, 50 psi differential	Fischer & Porter Co.
Automatic controller			Graduated in deg. temp.; responsive to 0.5 micro-amp. or <millivolt	Indicates and control AC and voltage; loads at 15 amp. 115 v.; 7.5 amp. 230 v.	Assembly Products, Inc.
Automat. reset pneum. relay	2"x3.25"x1.625"		Adds reset response to proportional controllers	Used with pneumatic proportional controllers with large load deviations	Minneapolis-Honeywell Reg. Co.
Automatic sampler			Accurate, rugged; can be set to sample periodically	To take cuts from stream of dry or wet material; 5-60 times per min.	Hardinge Co., Inc.
Automatic titrator		Al case, stainless steel	Completely automatic; better accuracy and speed than indicator method	Usual titrations; AC-powered pH meter; automatic pH adjustor	Beckman Instruments, Inc.
Batch control flow meter integrator	5 gpm up	Steel; stainless steel; bronze; Monel; Hastelloy C	Preset for batch quantity desired; resets for next batch; photo-elec. pickup avoids interference with integrator operation	Batch control for any batch or semi-batch process; Min. quantity determined by min. size orifices for which coeffic. are known	Republic Flow Meters Co.
Cabinet series instruments	Variety	Baked enamel case	May incorporate auxiliary eqpt.	Combinations unlimited; used with any primary element producing electrical impulses	Wheelco Inst. Co.
Cabinet type instrt. panel	24" w x 72" h x 12" d	Heavy gauge steel	Attractive uniform installation	Laboratory, plant, etc.	Wheelco Inst. Co.
Clip-on ring	4.5, 6"	Al, brass	Eliminates stuck rings due to corrosion		Clapp Instrument Co.
Color-Grafic* panels	Controller mounted in and/or below flow diagrams	To suit	Color and symbols for better visual coordin. and identification of controller with pt. of application	Any continuous process, particularly refineries	Minneapolis-Honeywell Reg. Co.
Conductivity bridge			Effective scale length of 84"; line freq. and 1000 c.p.s.; instantaneous switching;	For resistances 0.2-2,500,000 ohms	Indust l. Instruments, Inc.
Control drive	280-400 and 400-1500 ft-lbs. torque		Covered for protection from dust, severe weather, excessive moisture	Operate dampers, fan inlet vanes, rheostats, turbine governors, levers, etc.	Bailey Meter Co.
Control valve			Quick reversibility; air operated		Foxboro Co.
Cooling H O control	2" line and up		Midget size; insertion type; pneumatic; sensitive; accurate	For use with Honeywell* pneum. valves	Minneapolis-Honeywell Reg. Co.
Current controller			Std. electric component; pneum. cylinder operator; accurate; sensitive	Converts pneumatic to electric control	Conoflow Corp.
Dial indicator	12" dial		Concentric dial; large numerals and graduations	Flow, liquid level, press.	Taylor Instrument Cos.
Diaph. actuated reducing and / or back press. regulator	0.5-2" screwed globe; 1-8" flanged globe	Cast iron, cast steel, or bronze body	Inner valve top and bottom guided; wide press. range	For sensitive press. control in vapor-vacuum and low-press. steam heating systems; Max. P.; partial vac.-40 psi max. T: 450° F. with fins 800° F	Black, Sivalls & Bryson, Inc.
Diaphragm power operator	600 lbs. load		Double acting; provides full load and positive lift		Minneapolis-Honeywell Reg. Co.
Diaphragm valve actuator	0.75-6"		Chemically inert linings and diaphragm; low press. drop; lightweight; leakproof; no sealing and lubricating trouble	For pneumatic or hydraulic operation to 105 psi	Grinnell Co., Inc.
Electric press. transmitter	Transmitter 7" rd. case; receiver 6, 8.5, 10, and 12" dial		115 v. 60 cycle AC; 2-wire DC transmission line; constant accuracy	To eliminate long high-P gage lines and confine hazardous lqds. and gases to source; To 50,000 psi	Manning, Maxwell & Moore, Inc.
Electric pyrometer	1-6 thermocouples	Fe-constantan, chromel-alumel, Cu-constantan	Automatically compensated for cold junct. temp. change; accurate rdgs. for low temps.	75 to 400, 1000, 1600, 2300° F; and −300 to +300° F	Thermo Electric Co., Inc.
Explosion-proof pressure switch		Al-housing	Spring actuated; diaphragm operated; operates 3 electr. circuits from press. source providing 5 psi range	To operate signals, motors, etc., by press. changes; Range: 0-20 psi. std.; 0-50 psi, special	Black, Sivalls & Bryson, Inc.
Filter-regulator	11" high	200 mesh Monel wire screen	Filtering and press. regulating combined; low P-drop; moisture and solids trapped by centrif. action	For non-corrosive gases to 125 psi and 120° F	C. A. Norgren Co.
Flanged diaphragm protector Flow gauge	1"	Various	For pressures to 2500 psi; clean-out type		Clapp Instrument Co.
			Short body; flanged or screwed; magnetic plug and soft-iron follower		Fischer & Porter Co.
Flowmeter	0.1 22 /min.-0.5 gpm lqd. 5 cc/min.-2 cfm air	Pyrex and tantalum floats	Compact; portable; 3 integral metering tubes	Research, pilot plant, field work	Brooks Rotameter Co.

Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations		Company
Flow meter	2 models		Direct reading; various mountings; compact; accurate	For air or non-corrosive gases		Hoke, Inc.
Force balance pneum. transmitter			Measures and transmits press. changes 0.5" H_2O; accuracy of 0.1 psi at high P; T and barom. compens.	Pressure applications	Short range spans: 40-415 psia; std. 3-15 psig output	Taylor Instrument Cos.
Gage illuminator	For all sizes	Albrackets; plastic	Evenly diffused light over entire length; single light	For transparent gages		Jerguson Gage & Valve Co.
Gas flow meter	45-16,000 cfh CO_2 200-76,000 cfh H_2	Stainless steel tube and float	Variable area; direct rdg. rotatable scale	Low press. service; also to 600 psi W.P.; temp. limited by available packing		Fischer & Porter Co.
Graphic weight recorder	All dial scale cap.	Same as scale	No mech. connection to scale	Wherever desired to group instrum. in single location		Toledo Scale Co.
Handwheel valve	1.25-16"		Eliminates conventional bypass; hand positioning of plug under any condition	Controlling	Valve stroke limit 0-100%	Hammel-Dahl Co.
High vac. gage	0.05-50 mm	Plastic case	McLeod type; calibrated in mm.	For wide range; where subject to contamination during operation		F. J. Stokes Machine Co.
High P diaphragm protector	To specification	Alloy or stainless steel	For press. to 4000 psi			Clapp Instrument Co.
Humidity controller Hygrodial	10" chart		Records and automatically controls; regulates wet-bulb depression; 2 pens Direct reading humidity and temp. indicator	Regulate flow of humidifying agent For lab., mfg., office and storage room		Weston Elect. Inst. Corp. Abbeon Supply Co.
Indicating pyrometer	5"x7.5"x9.5"; 4.75" scale		Dustproof housing; Alnico V magnet; flush and surface mounting; compact	Temp. control	Uses thermocouple	Wheelco Inst. Co.
Indicat. Pyrometer controller	4 types	Baked enamel case	Dustproof; Panelmount type; saves space	Control of temp., other variables	Uses thermocouple or radiation detector	Wheelco Inst. Co.
Insertion type temp. controller	135-190° F		Compact unit for pneumatic temp. control systems	Temp. control of liqds. in machines and processes		Minneapolis-Honeywell Reg. Co.
Karbate flow meter			For corrosive applications			Fischer & Porter Co.
Lab. diaph. motor valve	¼" in and outlet	303, 316, or 347 stainless steel bodies, other alloys	Spira-cro-meter* inner valve with equal % characteristics to handle minute quantities of fluid	For research labs. and pilot plants	Max. P: 3000 psi	Black, Sivalls & Bryson, Inc.
Liquid level Controller	Float cages 8" 125 lbs. or 250 lbs. cast trim. 8" 500 lbs. (300 lbs. ASA) cast steel. Valve size 0.5-2" screwed globe; 1", 1.5-4" flanged globe		Valve bodies reversible, inner-valve top and bottom guided	For circuit control of level; remote control of valves or instruments; operation of pumps; alarm systems or signals through Mercoid switch	4" body size, double ported	Black, Sivalls & Bryson, Inc.
Liquid level gages	All	All	May be used as flow glass or liqd. level gage; can be fitted with explosion-proof illumination; has 2" I.D.	Boiling fluids that are difficult to gage because of turbulent meniscus		Jerguson Gage & Valve Co.
Liquid level instruments			For corrosive service; travel up to 25 ft.			Fischer & Porter Co.
Liquid level transmitter	14-120"		Displacement type; not affected by type or corrosiveness of liquid; highly sensitive; does not require purges or seals	All liqd. measurement or control		Minneapolis-Honeywell Reg.
Liquid meter	0.5-6"	Bronze and iron; stainless steel in 1" and 2" sizes Plastic-lined	Automatic volume control accessories; automatic shutoff after delivery and recycle to 0 for next run; instant reset Min. Hg contamination; easy cleanout Elimination of press.-tight bearings or stuffing boxes	Measure and control liquid deliveries Line pressures to 200 psi	Need ordinary pipe press.; 110 volt circuit	Buffalo Meter Co. King Engr. Corp. Fischer & Porter Co.
Manometer Hg Manometer flow meters	12-116" scales 34, 50, 100, 200, 400" H_2O column eqvlt. range tubes					
Meter and control			Volumetric; indicator can be remote from meter; knob setting; automatic control	Indicating and controlling flow rate of corrosive liqds.		Hays Corp.
Metering pump	0-0.75 cc./stroke; 0-50 strokes/min.	316 stainless steel and carbon	Remote electronic control; packless seal	Metering small quant. of corrosive and other liquids	Max. P=5 psi	Eastern Industries, Inc.
Millivolt-meter controllers	8.625"x9"x9.875"		Sensitive, accurate galvanometer; electronic vane control	General use for temp. measurement and control		Minneapolis-Honeywell Reg. Co.
Moisture meter	4.5x4.5x3.125"		Portable; direct rdg.	To measure moisture content of wood or plaster	7-30% moisture	Weston Elect. Inst. Corp.
Multi-range record. potentiometer			Multiple ranges assure max. readability, segregate records, conserve space, etc.	Wherever 2 ranges are useful		Minneapolis-Honeywell Reg. Co.
Nylon and stainless steel movement	4.5, 6, 8.5, 10, 12"	Nylon and stainless steel	Better service from Nylon bushings and pinion			Clapp Instrument Co.
Orifice plates	1-6" I.D.; to 8" O.D.	Pyrex glass	Acid resistant; stable under high T; diamond ground edges	As flow meter accessory for corrosive liquids	Indirect external identificat.	Precision Thermom. & Instr. Co.
pH electrode		Special Beckman pH glass	Accurate over entire pH range; for continuous use from room temp. to above boiling	For high temp. process control at any pH		Beckman Instruments, Inc.
pH electrodes		Glass and plastic head	Moisture-proof; fast response; wide range of solutions; color coded for temp. rating	pH detection in industrial solutions; for immersion or flow cell assembly		Leeds & Northrup Co.
pH meter			High stability; min. drift; accurate, reproducible to 0.05 pH; continuous, direct rdg.		95-130 v. AC	Coleman Inst., Inc.
Pneum. controller recorder	19.06" w x 20.9" h x 9.81" d	Baked enamel case	Uses Wheelco electronic link	Measures temp., speed, flow, press., static strain load, etc.	Uses primary element (thermocouple, etc.)	Wheelco Inst. Co.
Pneumatic or electric transmitter Actagage	6"	Various	Extreme accuracy and ease of maintenance; no line length limit for electric type			Clapp Instrument Co.
Pneumatic low pressure controller		Bronze, stainless steel or Monel bellows	Controller range 1" Hg-20 psi; output to diaph. control valve 3-15 psi	Where low controller press. dictate diaph. control valve operation	Non-recording; max. P 20 psi	Black, Sivalls & Bryson, Inc.
Pneumatic power operator			Reversible pneumatic motor and gear driven screw stem	For valves, dampers and other control devices	Sensitive to 0.025 psi; stem loads to 10,000 lbs. stem travel to 20", 12"/min.	Conoflow Corp.
Pneumatic press. transmitter	transmitter 6" dial; receiver 6, 8.5, 10, 12" dial		Quick, safe, remote press. rdgs. with accuracy of 0.5%	To eliminate long high-P gage lines; confine hazardous liqds. and gases to source	Limited to 1000 ft; 50,000 psi; needs 30 lbs. air supply	Manning Maxwell & Moore, Inc.

Type of Equipment	*Sizes*	*Materials of Construction*	*Distinguishing Features*	*Applications and Limitations*		*Company*
Pneumatic transmitter	3″ dia. body-dia-phragm	Unlimited	Not affected by over press.; highly sensitive, accurate reproducible rdgs.; avlbl. for T to 1300 F; usable on concrete, glass lined, and wooden tanks	To measure lqd. level in press. and vented tanks; sp. gr.; press.; flow; vacuum		Instruments, Inc.
Pneumatic transmitter			May use Barton or mech. meter body	Use with flow measurement systems		Minneapolis-Honeywell Reg. Co.
Polarographic analyzer			Rapid; accurate; 1-piece console design; automatically plots diffusion current vs. voltage			Leeds & Northrup Co.
Positioning relay			Makes possible paralleling of characteristics of driven devices with those of other eqpt. in system; has reversible feature	To position accurately all Bailey control drives and control valves		Bailey Meter Co.
Press. and temp. recorder			Self-actuated tube system; 4 pens; stores 200 charts and 4 bottles ink		−100 to 800° F	Penn Indust. Inst. Corp.
Pycnorator Instruments			Submerged float, open bubblers, closed diaphragm, hydrometer types	Measure and control fluid density and sp. gr.		Fischer & Porter Co.
Radiation pyrometer			Extremely rapid response; 99% response in 1 sec.	For use with indicating, controlling, recording T in furnaces and kilns	800-4000° F	The Bristol Co.
Radiation Pyrometer			Quick setting optical system; hermetically sealed	For Micromax and Speedomax Rayotubes*; no protection reqrd.	below 350° F	Leeds & Northrup Co.
Radiamatic* pyrometers	125-7000° F		For use in limited space and on small targets	Radiant temp. measurement in metal industry, research		Minneapolis-Honeywell Reg. Co.
Radiation pyrometer			Minature; targets as small as 0.5″ dia.	For limited spaces,	200-2500° F	Minneapolis-Honeywell Reg. Co.
Radiation temp. detector			Hermetically sealed; sharp focus; to 350° F without cooling	All radiation-type temp. measurements		Leeds & Northrup Co.
Ratio flow control	5 gpm up; to 0.75 HP motors	Steel; stainless steel; bronze; Monel; Hastelloy C	Uses std. Thymotrol circuit and std. Republic meter; recording and integrating meter not needed	Ratio of speed of chem. pumps to flow in process lines	Min. quantity determ'd by min. size orifice for which coeffi. are known	Republic Flow Meters Co.
Recorder			Automatically plots 1 variable as function of other; 2 measuring circuits	Hysteresis loops, temp. vs. temp. diff., stress-strain; etc.		Leeds & Northrup Co.
Recording receiver	3″ strip chart; 4.875x5x18″		Small; 30-day chart; saves panel board space	Graphic or conventional panels	3-15 psi output	Taylor Instrument Cos.
Recording turbidimeter		Cast bronze sampling chamber	Instantaneous, continuous recording and indicating; on-off or modulating signal for process control	Monitor and control water treating, etc.	Ratio-measuring	General Electric Co.
Recording vacuum gage	0-50 ml.		Gage combined with audible alarm system	Use in small vacuum systems at P below 50 ml.		F. J. Stokes Co.
Rel. humidity Indicator	5.875x1.25x0.625″		Vest pocket size, self-contained slide calculator		Accurate to ±1 scale div.	Weston Electr. Inst. Corp.
Rotameter		0.25″ thick plastic window	2 or more rotameter tubes in one unit; each tube removable without disturbing others	For related flows; reflux & product; dilution; purging, etc.		Brooks Rotameter Co.
Saturation recorder controller	10″ chart	Weatherproof case	Automatic; operated by high-P gas; gas tight case	Natural gas saturation	0-110° F dry bulb	Weston Electr. Inst. Corp.
Shock-stop	4.5, 6, 8.5, 10, 12″	Stainless steel	No pulsation and shock effects on gage; can't plug up			Clapp Instrument Co.
Solenoid-actuated pen			No ink-throwing; speedy recording; V-type pen	Circular chart electronic potentiom.	8-day ink supply	Minneapolis-Honeywell Reg. Co.
Solenoid valve	For .075-8″ control valves	Carbon steel; type 316 stainless; Durimet 20; Ni; Monel; Hastelloy B, C, D	Teflon seat gives bubble-tight shut off	To control fluids to 3000 psi	Secondary P source 500-300 psi	The Annin Co.
Solid front Acragage	4.5, 6, 8.5, 10, 12″	Al, cast iron	Solid front case with waterproof blow-out disc on entire back			Clapp Instrument Co.
Solu-Bridge	80 ranges		Portable; dry cell operated; light weight; manual temp. compens.; electron tube null indicator	AC Wheatstone bridge use		Indust'l Instruments, Inc.
Static press. controls	0-20″ H_2O		Measures and gives alarm when P drop reaches pre-determined value; High accuracy; rapid pen speed	For very low P regulation	Fixed or variable diff. 0.2-2″ H_2O	Coral Designs
2 sec. strip chart potentiometers	Multipoint chart					Minneapolis-Honeywell Reg.
Temp. controller			Uses resistance measuring element and electronic amplifier	For temp. measurement and control	20 to 300° F	Minneapolis-Honeywell Reg. Co.
Temp. controller		Stainless heat exchanger	Circulation of tempering through jacket; closed circuit; self contained	textiles, food, etc. To hold temp. automatically within ±0.5° F		Pako Corp.
Temp. indicating products		Crayons and pellets		For temp. ranges between 1600 and 2000° F; pellets to 2500° F		Tempil Corp.
Temp. indicators	Various		Thermocouple or resistance thermometer	Cold-end comp. thermocouple to 3000° F, resistance thermom. to 3000° F		General Electric Co.
Temp. and press. instruments					−125 to 1000° F 30″ Hg vac.-10,000 psi	Fischer & Porter Co.
Temp. and press. recorders	6, 9, 12″ charts	Al and stainless steel	Friction-free stainless steel links and bearings; compl. stainless steel thermal system	All T and P applications	Max. T =1000° F	Gotham Instruments Div., Am. Machine&Metals, Inc.
Thermal conductivity units	5″x4″x3″; 6″x6″x6″	Stainless or brass	8-filament bridge; greater bridge output; larger variety of models	Contin. observat. of quant. change in gas mixtures		Gow-Mac Instr. Co.
Thermal system	700-1200° F		347 stainless steel thermal element; Bourdon type spring; ambient temp. compensation	Measurement and control of temp.		Taylor Inst. Cos.
Thermocouples	8, 14, 20, 25 gage wire	Cu-constantan; Fe-constantan; chromel-alumel; Pt-Pt Rh	Faster response; electric butt welds	General temp. measurement		Minneapolis-Honeywell Reg. Co.
Thermo-regulator	14″ long		Wide range set quickly; ring knob adjustment		−38 to 50° F; 30-600° F models	H-B Instruments Co.
Time-delay valve	0.25-1.25″		Volume-measurement of air operation; air conditioned	Constant repetition of time sequence		Ross Operating Valve Co.
Time-temp.	program controls 8 models	Baked enamel case	Selection of ranges; large roomy case	Industr. processing of metals, chemicals, etc.	Uses pyrometer or resist. thermometer measur. system	Wheelco Inst. Co.

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Type of Equipment	Sizes	Materials of Construction	Distinguishing Features	Applications and Limitations	Company
Titrilog	66x22.5x18.5"		Automatic recording		
Turbidity detector			Electronic; instant detection; warning or on-off device; independent of color of sol'n.; no zeroing	Trace quantities of oxidizable S-cpds. in gases; 0.005 grains/100 ft³	Consolidated Engr. Corp.
Vacuum gage	1-1,000 microns	Noble-metal thermopile	Accurate electr. indicator; fast response; pickup interchangeability without recalibration	To detect suspended impurities in transparent lqds.	Electric Eye Eqpt. Co.
Viscosity controller			Continuous; automatic; enclosed working parts; 1% sensitivity	Remote indication and recording	Hastings Instrument Co.
Volume regulator			Only a single moving part; holds preset volume constant while upstream P may vary over 100 psi	Textile sizing, standard roll coating, dip tanks, blending operations 2-50,000 cps. Constant volume Vertical cylinder flow	Brookfield Engr. Lab., Inc. W. A. Kates Co.

Equipment Company Addresses

Abbeon Supply Co., Woodside, N. Y.
Alloy Steel Products Co., Linden, N. J.
American District Steam Co., North Tonawanda, N. Y.
American-La France-Foamite Corp., Elmira, N. Y.
American Machine & Foundry Co., 485 Fifth Avenue, New York 17, N. Y.
American Machine & Metals, Inc., Gotham Instruments Division, 149 Wooster St., New York 12, N. Y.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Optical Company, Southbridge, Mass.
Ampco Metal, Inc., 1745 S. 38th St., Milwaukee, Wis.
Amplex Mfg. Co., Div. Chrysler Corp., Detroit 31, Mich.
The Annin Co., 3234 Mines Ave., Los Angeles, Calif.
Ansul Chemical Co., Marienette, Wisc.
Assembly Products, Inc., Chagrin Falls, Ohio
Atlas Valve Co., 282 South St., Newark, N. J.
Automatic Control Co., 1005 University Ave., St. Paul, Minn.

Baker & Co., Inc., E. Newark, N. J.
Baker-Raulang Co., 1250 W. 80th St., Cleveland, Ohio
Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio
The Bauer Bros Co., 1727 Sheridan Ave., Springfield, Ohio
Beckman Instruments, Inc., South Pasadena 17, Cal.
Belfield Valve Div., Minneapolis-Honeywell Reg. Co., 2954 Fourth Ave., Minneapolis, Minn.
Belt Corp., Orient, Ohio
Bete Fog Nozzle Co., 20 Federal St., Greenfield, Mass.
Bigelow-Liptak Corp., 2842 W. Grand Blvd., Detroit 2, Mich.
Black, Sivalls & Bryson, Inc., Climax Controls Division, P. O. Box 1529, Tulsa 1, Okla.
Blackmer Pump Co., Grand Rapids, Mich.
Bowen Engr., Inc., 100 Station Rd. North Branch, N. J.
The Bristol Co., Waterbury 20, Conn.
Brookfield Engineering Laboratories, Inc., Stoughton, Mass.
Brooks Rotameter Co., Lansdale, Pa.
The Brown Fintube Co., Elyria, Ohio
Buffalo Meter Co., 2917 Main St., Buffalo 14, N. Y.
Burgess-Parr Co., Freeport, Ill.

C-O-Two Fire Eqpt. Co., P. O. Box 390, U. S. Highway 1, Newark 1, N. J.
The Philip Carey Mfg. Co., Lockland, Cincinnati 15, Ohio
The Carpenter Steel Co., Alloy Tube Div., Union, N. J.
The Ralph B. Carter Co., 210 Atlantic St., Hackensack, N. J.
Carter Products Corp., 10193 Meech Ave., Cleveland 5, Ohio
Chemequip Co., 193 Bradford St., Brooklyn 7, N. Y.
Chicago Metal Hose Corp., 1300 S. 3rd St., Maywood, Ill.
Chiksan Co., Brea, Calif.
Clapp Instrument Co., Webster, Mass.
Clark Bros. Co., Inc., Olean, N. Y.
Clark Mfg. Co., 1830 E. 38th St., Cleveland 14, Ohio
Coleman Instruments, Inc., Maywood, Ill.
Conoflow Corp., 2100 Arch St., Philadelphia 3, Pa.
Consolidated Engr. Corp., 620 N. Lake Ave. Pasadena 4, Calif.
Consolidated Siphon Supply Co., 22 Wooster Street, New York, N. Y.
Coral Designs, Box 248, Forrest Hills, N. Y.
Corning Glass Works, Corning, N. Y.
Crane Co., Chicago 5, Ill.
Crane Packing Co., 1800 Cuyler St., Chicago, Ill.
Crawford Fitting Co., Cleveland 17, Ohio

Daffin Mfg. Co., Lancaster, Pa.
Davis Engr. Corp., 30 Rockefeller Plaza, New York 20, N. Y.
DeBothezat Fans Division, American Machine & Metals, Inc., East Moline, Ill.
De Laval Steam Turbine Co., Trenton 2, N. J.
Delta Engr. Sales Co., Box 678, Shreveport, La.
The Dorr Co., Barry Place, Stamford, Conn.
Doyle & Roth Mfg. Co., Foot 23rd St., Brooklyn, 32, N. Y.
The Durirron Co., Inc., Dayton 1, Ohio

Eastern Industries, Inc., 296 Elm St., New Haven 6, Conn.
Eco Engr. Co., 12 New York Ave., Newark 1, N. J.
Edward Valves, Inc., E. Chicago, Indiana
Eitel-McCullough, Inc., 1570 San Mateo Ave., San Bruno, Cal.
Electric Eye Eqpt. Co., Danville, Ill.
The Electric Hotpack Co., Inc., Cottman Ave. at Melrose St., Philadelphia 35, Pa.
Elgin Softener Corp., Elgin, Ill.
Elliott Co., Accessories Dept., Jeannette, Pa.
Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, Ohio
Emerson-Scheuring Tank & Mfg. Co., Inc., 21st St. & Martindale Ave., Indianapolis 7, Ind.
Emmett Machine & Mfg., Inc., 2249 14th St. S.W., Akron 14, Ohio
Charles Engelhard, Inc., 850 Passaic Ave., E. Newark, N. J.
Enzinger Union Corp., Angola, N. Y.
Eppenbach, Inc., 45-10 Vernon Blvd., L. I. City 1, N. Y.
Eriez Mfg. Co., 420 Commerce Bldg., Erie, Pa.
Ertel Engr. Corp., Kingston, N. Y.

Farris Engr. Corp., Palisades Park, N. J.
Felt Products Mfg. Co., Packing Div., 1508 Carroll Ave., Chicago 7, Ill.
Flexoveyor Mfg. Co., 1220 South Acoma St., Denver, Colo.
Filtration Engineers, Inc., 155 Oraton St., Newark 4, N. J.
Fischer & Porter Co., County Line Road, Hatboro, Pa.
Flexitallic Gasket Co., Camden, N. J.
Foxboro Co., Foxboro, Mass.
Frontier Industries, Inc., Manzel Div., 224 Babcock St., Buffalo 10, N. Y.

General American Transportation Corp., Louisville Drying Machinery Unit, 139 S. Fourth St., Louisville 2, Ky.
General American Transportation Corp., Process Equipment Div., 10 East 49th St., New York 17, N. Y.
General Ceramics & Steatite Corp., Keasbey, N. J.
The General Detroit Corp., Detroit 32, Mich.
General Electric Co., Apparatus Dept., 1 River Road, Schenectady 5, N. Y.
Gerotor May Corp., Dept. E, Baltimore 3, Md.
Gifford-Wood Co., Hudson, N. Y.
Gil-Lair Products, Inc., 81 Masonic Court, Pasadena, Calif.
The B. F. Goodrich Co., Akron, Ohio
Goulds Pumps, Inc., Seneca Falls, N. Y.
Gow-Mac Instrument Co., 22 Lawrence St., Newark 5, N. J.
Greene, Tweed & Co., North Wales, Pa.
Grinnell Co., Inc., Providence 1, R. I.
B. F. Gump Co., 431 S. Clinton St., Chicago 7, Ill.

H-B Instruments Co., Dept. T-6, 2633 Trenton Ave., Philadelphia 25, Pa.
Hammel-Dahl Co., 243 Richmond St., Providence 3, R. I.
Hardinge Co., Inc., 240 Arch St., York, Pa.
Hastings Instrument Co., Hampton, Va.
Hays Corp., Michigan City, Ind.
Hercules Filter Corp., 204 21st Ave., Paterson 3, N. J.
Hevi Duty Electric Co., 4212 W. Highland Blvd., Milwaukee 1, Wisc.
Hewitt-Robins, Inc., Robins Conveyors Div., 270 Passaic, N. J.
Hills-McCanna Co., 3025 N. Western Ave., Chicago 18, Ill.
Hoke, Inc., Englewood, N. J.
Hoppe Engr. Co., Greensboro, Ind.
Hyster Co., Portland 8, Oregon

Illinois Water Treatment Co., 840 Cedar St., Rockford, Ill.
Industrial Instruments, Inc., 158 Culver Ave., Jersey City 5, N. J.
Industrial Process Engrs., 8 Lister Ave., Newark 5, N. J.
Ingersoll-Rand Co., Phillipsburg, N. J.
Instruments, Inc., 525 Wright Bldg., Tulsa, Okla.

Jerguson Gage & Valve Co., 87 Fellsway, Somerville 45, Mass.
Johnson Corp., Three Rivers, Mich.

W. A. Kates Co., Deerfield, Ill.
King Engr. Corp., Box 100, Ann Arbor, Mich.
Klipfel Valves, Inc., Div. of Hamilton-Thomas Corp., Hamilton, Ohio
Koch Engineering Co., Wichita, Kansas
Kunkle Valve Co., 111 S. Clinton St., Fort Wayne 2, Ind.

Lapp Insulator Co., Inc., LeRoy, N. Y.
Lee Metal Products Co., Inc., Philipsburg, Pa.
Lee Rubber & Tire Corp., Republic Rubber Div., Youngstown 1, Ohio
Leeds & Northrup Co., 4901 Stenton Ave., Philadelphia 44, Pa.
Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.
Evarts G. Loomis Co., 126 So. 14th St., Newark 7, N. J.
Lor-Ann Instrument, 58 Montgomery St., Jersey City 2, N. J.
Lumenite Electronic Co., 407 S. Dearborn St., Chicago 5, Ill.
The Lunkenheimer Co., Beekman & Waverly Sts., Cincinnati 14, Ohio
Lyon-Raymond Corp., Greene, N. Y.

McNally Pittsburgh Mfg. Corp., Pittsburgh, Kan.
McRae Valve Corp., 620 S. Main St., Los Angeles 14, Calif.
Manning, Maxwell & Moore, Inc., Bridgeport 2, Conn.
The Marley Co., Inc., Fairfax and Marley Rds., Kansas City 15, Kansas
Marlow Pumps, Ridgewood, N. J.
Merco Centrifugal Co., San Francisco, Calif.
The Michigan Pipe Co., Bay City, Mich.
Michna Systems, 5051 S. Western Ave., Chicago, Ill.
Micro Metallic Corp., 193 Bradford St., Brooklyn, N. Y.
Milton Roy Co., Philadelphia 18, Pa.
Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne & Roberts Aves., Philadelphia 44, Pa.
Mixing Eqpt. Co., Inc., 1024 Garson Ave., Rochester 9, N. Y.
Modern Equipment Co., Inc., 2011 Cuming St., Omaha 2, Neb.
Moore Products Co., H & Lycoming Streets, Philadelphia 24, Pa.
Morehouse Industries, 1156 San Fernando Road, Los Angeles 65, Cal.
Morganite, Inc., 33-02 48th Ave., L. I. City, N. Y.

(Turn to page 348)

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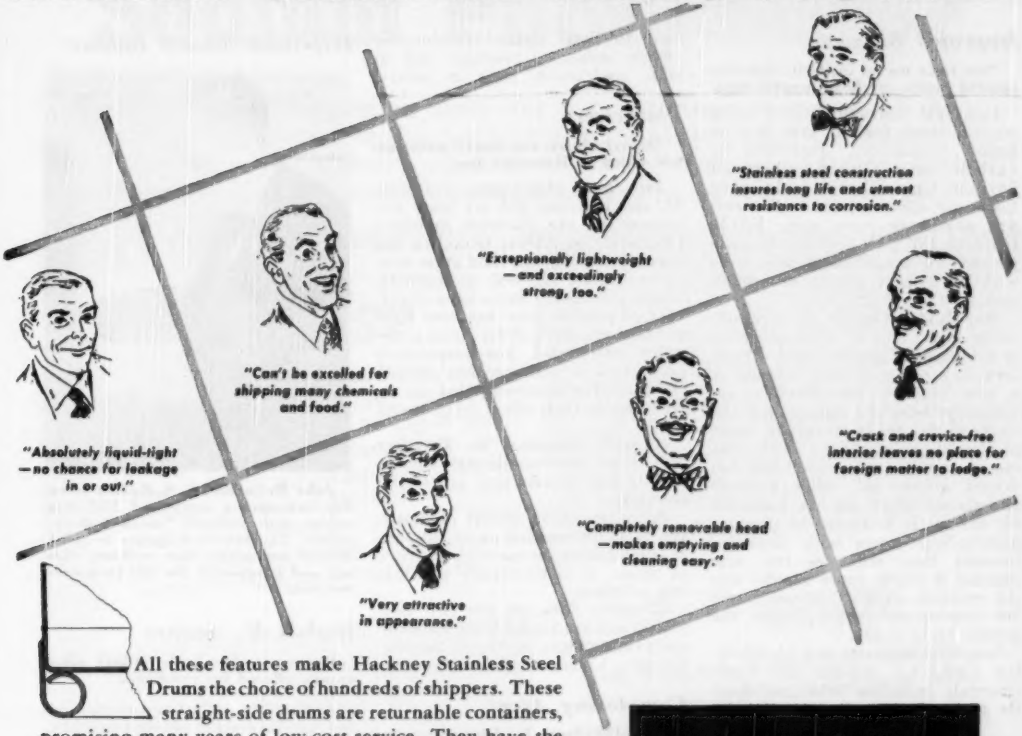
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"Crack and crevice-free interior leaves no place for foreign matter to lodge."
"Completely removable head —makes emptying and cleaning easy."
"Very attractive in appearance."

All these features make Hackney Stainless Steel Drums the choice of hundreds of shippers. These straight-side drums are returnable containers, promising many years of low-cost service. They have the specially formed Hackney welded chime construction which insures a smooth bottom, so easily and positively cleaned. Thus, the advantages of easy cleaning and sanitation make Hackney Stainless Steel Drums the logical containers for many chemical and food shippers.

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NEW PRODUCTS & PROCESSES

Isopropyl Benzoate

New ester useful in itself, also convenient source of cheap benzoic acid.

Isopropyl benzoate is now being manufactured for the first time in major commercial quantities by Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corp. Its current price is 22 cents per pound in tank cars, F.O.B. Institute, W. Va., which is competitive on a contained acid basis with the impure grades of benzoic acid.

Isopropyl benzoate is a water-white liquid and by ester exchange is a source of benzoic acid. Therefore, it is of particular interest as a raw material for alkyd resins. Isopropyl benzoate reduces the viscosity during the intermediate stages of the "cook," dissolves easily, and reacts rapidly with available hydroxyl groups of other alcohols and glycols which are raw materials for resins. It is easier to produce high-boiling esters with isopropyl benzoate than with the free acid because it reacts more rapidly and the reaction product is not water but isopropanol, which leaves the system more easily.

Isopropyl benzoate is a high-boiling (218.5°C.) solvent for many materials including inks and dyes. Its pleasant aromatic odor can be used to build desirable odors in certain industrial products and to mask undesirable ones in others.

Glidden Makes Cortisone

Adrian D. Joyce, chairman of the board of the Glidden Co., displays a gram of the first Glidden-made Cortisone, important aid in the treatment of rheumatoid arthritis. Produced at the company's Soya Products Division plant in Chicago, this single gram is worth more than $100.

Plasticizers

Dioctyl adipate and dioctyl phthalate are added to Harwick's line.

Two new plasticizers, Polycizer 332 and Polycizer 162, are being distributed by the Harwick Standard Chemical Co., Akron, Ohio, for use in compounding vinyl and other synthetic resins as well as rubbers. These plasticizers have been developed to provide good heat and light stability, excellent stress-strain properties and good low-temperature properties. In addition they provide compounding economies that are interesting in their effect on material costs.

Harwick classifies its Polycizer 332 as an odorless dioctyl adipate that is low in acid and practically colorless.

Polycizer 162 is dioctyl phthalate and is recommended as an all-purpose plasticizer for use with all types of resins. It is practically odorless and colorless.

Complete data on the two new plasticizers are available through the company's offices in Akron, Boston, Trenton, Chicago and Los Angeles.

Complexing Agent

2, 5-Dihydroxy-1, 4-benzoquinone forms stable, commercially useful complexes with metals.

Edwal Laboratories, Inc., Ringwood, Ill., have made available for the first time pilot-plant quantities of 2,5-dihydroxy-1,4-benzoquinone, referred to as DHQ.

This compound and its derivatives were discussed in a recent article (Frank, Clark and Coker, *J. Am. Chem. Soc. 72*, 1827, April 1950). DHQ is available as yellow to deep orange crystalline powder, titrating better than 97% purity.

DHQ forms stable complexes with metal ions, some of which are highly colored. The complexes with the lighter metals are soluble, while those with heavy metals are, in general, insoluble. Some of the DHQ metal complexes are available in research quantities, and it is planned to market these organo-metallic compounds also, if commercial demand arises.

Some of the uses suggested for DHQ and its metallic derivatives, based on their chemical properties, and on analogy to compounds with similar functional groups are: antioxidant and stabilizer in plastics and oils, particularly where deterioration is catalyzed by traces of metals; organic carrier for heavy metals for pharmaceutical and preservative uses; synthetic intermediate.

Data sheets and working samples are available on application to the company.

Improved Natural Rubber

John McGavack, U. S. Rubber scientist, compares a sample of USF type rubber with ordinary "smoked sheet" rubber. The former is lighter in color, cleaner and softer than ordinary rubber and is superior for use in special products.

High-M.-W. Amines

Primary amines with tertiary alkyl groups offered for synthesis.

Availability of tertiary-octylamine and Alkylamine 81, two new primary, aliphatic amines, has been announced by Rohm & Haas Co. Both amines have the tertiary-alkylamine structure, in which the primary amino nitrogen is directly attached to a tertiary carbon atom.

Tertiary-octylamine (2,4,4-trimethyl-2-aminopentane) is a pure eight-carbon amine, boiling at 140° C., while Alkylamine 81 is a mixture of highly branched primary amines, with the number of carbon atoms varying from twelve to fifteen, and has a boiling range of 220-260°C. Both products are supplied as clear, straw-yellow, distilled liquids, with remarkably good color retention. They are comparable in basic strength to straight-chain aliphatic amines of the same molecular-weight range.

In general, these amines undergo the typical reactions of primary, aliphatic amines, but the presence of the tertiary-alkyl group imparts certain distinctive properties. For example, stable, monomeric aldimines are formed by reaction with aliphatic aldehydes, the reaction with formaldehyde giving a stable azomethine, $RN{=}CH_2$. Such reac-

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V-C Sodium Phosphates are widely used in the manufacture of cleansers and detergents, and in water treatment. But V-C Sodium Phosphates also have countless other uses which make them versatile, dependable "work horses" of the chemical industry. Produced from phosphoric acids, made from elemental phosphorus, they are of the highest purity.

V-C DSP

V-C Disodium Phosphate is employed by the textile industry in dyeing, scouring, kier-boiling and boiling-off operations. It serves as a plasticizer in processing cheese; and is used in tanning; in ceramic glazes; in metal treatment; and in emulsifying condensed milk. V-C DSP, in an exceptionally pure Drug Grade, is extensively used in pharmaceuticals.

V-C TSP

V-C Trisodium Phosphate is one of the most widely used emulsifiers and water softeners. It also has special utility in asphalt emulsions; fireproofing compositions with ammonium salts; photographic developers; and adhesives.

V-C TSPP

V-C Tetrasodium Pyrophosphate is used in textile and paper processing; in the manufacture of ceramics; as a buffer salt in cosmetics and food products; and as an ingredient of insecticides and bait eradicators.

V-C STPP

V-C Sodium Tripolyphosphate with its sequestration properties is used in drilling fluids for mud treatment; in cold-water paints of the casein-lithopone type; in cement to delay setting time; in cheese manufacture; in textile and leather processing; as a dispersing and peptizing agent in clay purification; and in laundry cleansers.

These are only a few of the many uses which have made V-C Sodium Phosphates famous for their quality and purity. V-C Sodium Phosphates are as close to you as your telephone. Place your order today for shipment by rail or water . . . or 48-hour truck delivery in Middle Atlantic and Southeastern states.

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tions as alkylation with alkyl halides, cyanoethylation and hydroxyethylation can be readily controlled to give mono-substituted products, with little interference by tertiary amine formation. Such unique properties render these amines of considerable interest in the field of synthetic organic chemistry.

Tertiary - octylamine and Alkylamine 81 may be expected to be applicable to the normal uses for primary aliphatic amines of their molecular-weight range, although their branched-chain structure and modified reactivity should be taken into consideration. Among such applications are the synthesis of insecticides, bactericides, fungicides, wetting agents, textile - finishing agents, detergents, emulsifiers, pharmaceuticals, corrosion inhibitors for metals, and for the introduction of oil-soluble groups into anti-oxidants and other oil additives.

Samples and technical literature containing experimental directions for many of the reactions of these amines are available from Department SP, Rohm & Haas Co., Washington Square, Philadelphia 5, Pa.

Benzophenone

Technical grade of benzophenone widens its potential uses.

Kay-Fries Chemicals, New York, is making available an "intermediates" grade of benzophenone, in order to stimulate the use of this material in commercial chemical syntheses. A perfume grade of benzophenone has long been manufactured by Kay-Fries; however, considerable saving in production costs have been effected on the new "intermediates" grade, and the price is lower by more than 20%. Availability of the new grade of benzophenone may enable its potential as an intermediate to be realized.

Some of its suggested applications are as follows: intermediate for certain antihistaminics, hypnotics and other pharmaceuticals; intermediate for insecticides, dielectric media and general organic syntheses.

In order to promote interest in the synthetic possibilities of benzophenone, Kay-Fries has made a technical data bulletin available as a reference guide.

Cyanides

New production units increase supply of potassium, copper, and zinc cyanides.

Kraft Chemical Co. has announced the recent addition to the Kraft line of potassium cyanide, copper cyanide and zinc cyanide of exceptionally high quality.

These materials are being obtained through new production, which gives finishers and other commercial users a more flexible supply condition. The items named are companion products to the sodium cyanide which the firm began to market earlier this year. Full information regarding all these cyanides is available upon request to Kraft's main office, 917 W. 18th St., Chicago 8, Ill.

Vinyl Stabilizers

Tin and cadmium are the metallic elements of two new vinyl stabilizers.

Outstanding heat and light stability, clarity and improved life of product is claimed by Advance Solvents & Chemical Corp. for two new vinyl stabilizers.

Stabilizer H#52 is an organo-tin stabilizer that yields outstanding heat and light stability and distinctly improved clarity in all types of vinyl chloride and copolymer resins. It is a low viscosity liquid permitting easy incorporation into resins. The stabilizer is therefore ideally suited for transparent film work, including rigid vinyl sheeting.

Stabilizer H#21 is an ideal heat and light stabilizer for straight polyvinyl chloride polymers. It is a mobile, easy incorporated liquid. It differs from the usual metal salt stabilizers in that it combines the stabilizing action of cadmium with a radical that is a powerful acid acceptor.

Data sheets describing these products may be obtained by writing Advance Solvents & Chemical Corp., 245 Fifth Ave., New York 16, N. Y.

Myrcene from Pinene

Useful monomer made from turpentine in process licensable from Government.

A process for producing myrcene, a useful chemical intermediate, from β-pinene, a component of gum turpentine, has been developed in naval stores research at the Southern Regional Research Laboratory in New Orleans, La.

This process, which yields increased quantities and a higher quality of myrcene, is described in U. S. Patent No. 2,507,546. Licenses to use the patent on a royalty-free, nonexclusive basis, may be obtained by applying to the U. S. Department of Agriculture, Bureau of Agricultural and Industrial Chemistry, Washington 25, D. C.

Myrcene is a polyolefin with three double bonds, two of which are in terminal conjugation. It can be substituted for butadiene or isoprene in the manufacture of synthetic rubber, reacted with maleic anhydride or other dibasic acids to form resins, or it can be hydrated to produce polyhydric alcohols suitable for use in perfume bases. Other uses are well known in the chemical industry.

The new method of isomerizing β-pinene to myrcene is based on the discovery that much higher yields and a better quality product can be

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ANSUL SO_2 SYSTEM

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Chemical	Ansul Liquid Sulfur Dioxide	Burner Gas	
		Poor Operation	Very Efficient Operation
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SO_3	0.00	1.95	0.10
H_2O	less than 0.01	1.47	0.40
S (Sublimed)	0.00	0.49	0.10
N_2	less than 0.10 (L.P.)	76.50	78.32
O_2		13.72	1.00
A		.97	1.00
Ash	0.00	Trace	Trace

It's so easy to install this Ansul SO_2 System and get these proved advantages:

GREATER SOLUBILITY — As indicated in the table, much more concentrated water solutions of SO_2 may be obtained from 99.9+% Ansul Liquid SO_2 than from the most efficiently produced burner gas.

HIGHER PURITY — Elimination of impurities inherent in burner gas (Ansul Liquid SO_2 is 99.9+% (by weight) PURE).

CONTROL — Easy, positive control providing extreme accuracy for reaction or adjustment of pH.

GREATER ECONOMY — Small investment in equipment, materially reduced operating and maintenance costs, and freeing of valuable floor space.

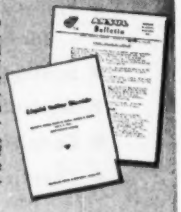
PHYSICAL PROPERTIES

Chemical formula ..... SO_2
Molecular weight 64.06
Color (gas and liquid) .... Colorless
Odor ..... Characteristic, pungent
Melting point —103.9°F. (—75.5°C.)
Boiling point ... 14.0°F. (—10.0°C.)
Density of liquid at 80°F. (85.03 lbs. per cu. ft.)
Specific gravity at 80°F. 1.363
Density of gas at 0° C. and 760 mm: 2.9267 grams per liter (0.1827 lb. per cu. ft.)
Critical temperature 314.82°F. (157.12°C.)
Critical pressure 1141.5 lbs. per sq. in. abs.
Solubility ..... Soluble in water
Purity ..... 99.9+% (by wt.) SO_2 (H_2O less than 0.01%)

*REG. U. S. PAT. OFF.

WRITE THE ANSUL TECHNICAL STAFF FOR FURTHER INFORMATION

Send for Bulletin C-020.1, "A comparison of Ansul SO_2 and Sulfur Burner Gas," and also for your copy of "Liquid Sulfur Dioxide" — a treatise on the properties, characteristics, and industrial uses of Liquid Sulfur Dioxide — written by the Ansul Technical Staff.



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INDUSTRIAL CHEMICALS DIVISION, MARINETTE, WISCONSIN
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obtained at temperatures considerably above those ordinarily used, provided the vapor is subjected to such temperatures very briefly. High-quality myrcene representing as much as 85 percent of the β-pinene used has been produced by subjecting vapors of β-pinene to a temperature above 700 degrees C. for less than one-hundredth up to about a tenth of a second. The procedure is suitable for use in a small reaction system.

Wax Additive

Spreading agent improves spreading, penetration and adhesiveness of paraffin waxes.

An efficient spreading agent, Paraspred, for paraffin and microcrystalline waxes is now in full commercial production. In addition to its spreading properties, Paraspred plasticizes paraffin wax, improving its adhesiveness. Penetration of the wax into porous materials such as paper and textiles is greatly improved.

As little as 1% Paraspred added to paraffin wax causes it to spread readily even on damp surfaces. (This is presently being applied in wax coatings for cheese.) Ten per cent Paraspred plasticizes paraffin wax to give very flexible, thin coatings of wax. The higher concentrations enable the wax to penetrate into opaque white paper to give translucence to the paper. Improved adhesive properties of the paraffin are also evident with the higher concentrations.

Paraspred is a non-toxic, soft, waxy solid, cream to yellow in color, with a melting range of 92°-97° F. (33°-37° C.). It is available in commercial quantities and samples are available from the manufacturer, Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N. Y.

Vinyl Stabilizers

Co-precipitates of lead orthosilicate and silica gel disperse well in vinyls.

Two new stabilizers for vinyl plastics are now produced by National Lead Co., 111 Broadway, New York 6, N. Y. Called "Dutch Boy" Plumb-O-Sil "C" and Plumb-O-Sil "D," they are co-precipitates of lead orthosilicate and silica gel and are characterized by easy dispersion in vinyl plastic products. Used primarily in translucent compounds, they impart heat and light stability to vinyl plastics, especially those with vivid colors and of deep shades. Plumb-O-Sil "C" and "D" are now available commercially.

• Calco Chemical Division of American Cyanamid Co. has developed a non-staining, non-discoloring **antioxidant** for white and light-colored rubber products. It is called Antioxidant 2246.

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AMINES

Available in Commercial Quantities

Ethylamine
Diethylamine
Triethylamine

Butylamine
Dibutylamine
Tributylamine

Isobutylamine
Diisobutylamine

Isopropylamine
Diisopropylamine

Diethylaminoethanol
Mixed Ethylethanolamines
Dimethylaminoethanol

Available in Semi-Commercial Quantities

n-Propylamine
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Experimental quantities of other amines are available.

For additional information, prices and samples write Dept. A.

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NEW EQUIPMENT

Drying Ovens

New ovens range from laboratory size to 6′ x 10′.

W. S. Rockwell Co., Fairfield, Conn., announces three new types of Gehnrich batch ovens for industrial process heating up to 500° F. The bench oven is a laboratory model with tray loading for drying glassware or small quantities of chemicals, pharmaceuticals, organic finishes, etc. It is available with either gas or electric heating. The cabinet type oven, also gas or electric heated, is for larger heating operations in the same categories and is adaptable to either tray or batch loading. The truck oven, provided with special floor guide channels, is a heavy duty heating equipment capable of handling large quantities of charge. It is available with any one of six types of heating systems: direct gas; indirect gas; direct oil; indirect oil; electric or steam.

Statically and dynamically balanced fans effect uniform recirculation of heated air. Each oven has a gravity stack with an adjustable damper for controlling exhaust of volatiles or vapors for maximum safety of operation.

Bench ovens are available with inside working areas of 12″ x 12″, 18″ x 18″ and 24″ x 24″. The larger cabinet ovens have working spaces of 2′ x 3′, 3′ x 3′ and 3′ x 4′ respectively. Eighteen sizes of truck ovens are available ranging from an inside working space of 3′ x 4′ to 6′ x 10′.

Recorder

New recorder can be easily changed from temperature to pressure recording.

The new 6″ chart recorder of Gotham Instruments Div. of American Machine & Metals, Inc., 149 Wooster St., New York 12, N. Y., records temperatures and pressures under a variety of changing conditions. The recorder measures only 8⅜″ x 10⅝″ x 3¼″, and weighs only 7½ pounds, not including the tubing. Temperature and pressure systems of this recorder are interchangeable. The mounting brackets furnished are reversible so that the recorder may be flush or wall mounted. Legs and handle, though not standard equipment, are also available to make the recorder portable and self-standing.

Temperature ranges cover from —40° to 1000° F. (or the equivalent in Centigrade); pressure system ranges cover from 0 to 500 psi.

The bulb of the instrument is supplied with mercury, gas or vapor filling according to use. Size of the bulb depends upon the filling and the length of tubing actuated and can be made from stainless steel for use under corrosive conditions.

Hand Threader

A new hand threading tool for use with "Karbate" impervious graphite pipe is available from National Carbon Div., UCC, 100 E. 42nd St., New York 17, N.Y.

Recording Turbidimeter

A new photoelectric instrument automatically measures and records the amount of suspended particles in a liquid.

The new recording turbidimeter of the Special Products Div. of General Electric Co., Schenectady 5, N. Y., monitors and controls processes wherever turbidity is a significant process condition. Experimental tests using the recording turbidimeter for monitoring are being conducted in sewage treatment, chemical, paper, and bottling plants. Compact in design, it automatically gives continuous readings of turbidity, alerting the operator when certain predetermined limits are exceeded.

The new instrument operates on the principle that turbidity of a liquid varies in direct proportion to the ratio of scattered light to transmitted light through the liquid. Since it is a ratio-measuring instrument, results are not subject to color variations of the liquids under test or by variations in voltage supplied to the light source used.

The equipment consists of a cast bronze sampling chamber mounted at the process, and a strip chart or circular chart recorder located remote from the primary element. The sampling chamber houses three hermetically sealed photo voltaic cells: one to measure transmitted light and two to measure scattered light. The light source, a 100-watt projection lamp, operates at reduced voltage for longer life.

The recording element may be furnished calibrated or uncalibrated on the silica-scale. Two adjustments are provided for self-calibration: a zero scale set and a range setting. The instrument scale can be made to read any desired range of turbidity.

The equipment operating on a 115-volt, 50/60-cycle circuit, has a power consumption of approximately 150 watts.

• A new **hopper discharge valve** designed for continuous withdrawal of dust or powdered material from a collection hopper is announced by Buell Engineering Co., 70 Pine St., New York 5, N. Y.

A gear reduction motor drives a cam for automatic opening and closing of the two valve discs four times a minute. Shock of closing of the discs shakes loose all clinging material. This assures steady flow and prevents plugging. Capacity is 103.2 cu. ft. of dust per hour.

• Reduced prices for a new standard line of **accessories for photoelectric relays,** consisting of a complete range of improved light sources and phototube holders, has been announced by General Electric Co., Schenectady, N. Y.

• A new device has been developed by Brown Instruments Div., Minneapolis-Honeywell Regulator Co., Philadelphia, Pa., for measuring and controlling temperatures up to 7,000° F. The instrument is a modified version of a Brown **Radiamatic pyrometer head** which is used with an Electronik potentiometer.

It is designed for sighting on relatively small targets, through a clear path of ¼″ in diameter. It consists of a lens and thermopile. In operation, radiant energy from the hot target is focused by the lens on the sensitive thermopile. The amount of radiant energy received by the thermopile determines the temperature to which the hot junction will rise.

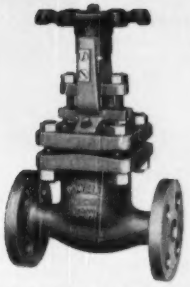
• The Polalite Corp. of Whitestone, L. I., N. Y., announces a new line of **polarized safety glasses.** The lenses are made of glass with a plastic safety interlayer. Polarization is obtained from a continuous crystalline polarizing layer included within the safety interlayer.

• Type 10CB1 **level control** of Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass., provides maintenance-free level control to the chemical processing industry. Contact with the liquid is made only by stainless steel probe rods. No floats or other moving parts are required in the tank.

The probe circuit can be selected

Avoid "*DOWN-TIME*" for Maintenance—*Standardize* on the POWELL LINE

Fig. 2453-G — Large 150-pound Stainless Steel Gate Valve with bolted flanged yoke-bonnet, outside screw rising stem and tapered solid wedge. Available in sizes 5" to 30", inclusive.



Bell-O-Seal Globe Valve. Designed especially to handle hazardous fluids; for high vacuum service; or for use wherever a packless valve is needed. Available in Globe, Angle, and "Y" patterns, with screwed, flanged, or welding ends. Can be furnished in various corrosion-resisting metals and alloys, in sizes from ¼" to 12", inclusive.

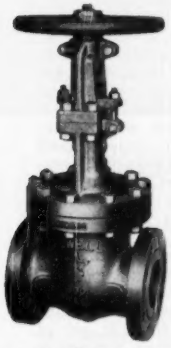


Fig. 3003—Class 300-pound Cast Steel Gate Valve with flanged ends, outside screw rising stem, bolted flanged yoke, tapered solid wedge.

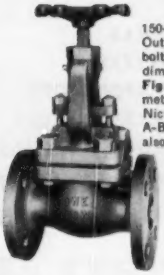
Fig. 1793 — Large 125-pound Iron Body Bronze Mounted Gate Valve with flanged ends, bolted flanged yoke, outside screw rising stem and tapered solid wedge. Also available in All Iron.

Fig. 2608—A new 200-pound Bronze Globe Throttling Valve. Scientifically designed and proportioned to permit FULL FLOW through seat when wide open, greatly minimizing turbulence and pressure drop. Has special bronze stem and stainless steel disc and seat hardened to approximately 500 Brinell.

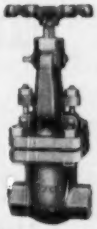
When you buy a valve, ask yourself these two questions. First, will it operate satisfactorily in the service in which it is to be used? Second, and of most importance, how much *maintenance* will it require? Because, every time maintenance becomes necessary, there's a two-fold cost. One, the cost of labor—and possibly parts—to put it back in working order. Two, the loss of production farther down the line.

And, because Powell Engineers *always* have this in mind, every valve in the *complete* Powell Line* is designed and made to avoid, as far as possible, "DOWN-TIME" for maintenance.

That's why, through the years, Powell Valves have been noted for long, trouble-free performance—even under the most exacting service conditions.



150-pound Flanged End Globe Valve, Outside screw rising stem and yoke, bolted flanged bonnet. Face-to-face dimensions conform to MSS SP42. **Fig. 2475** (18-8S, 18-8S Mo, Durimet "20"). **Fig. 2477** (Monel Metal, Nickel, Ampco Alloy, Hastelloy Alloys A-B-C, Everdur). These valves are also available with screwed ends.



150-pound Screwed End Gate Valve with outside screw rising stem and yoke, bolted flanged bonnet. **Fig. 2470** (18-8S, 18-8S Mo, Durimet "20"). **Fig. 2472** (Monel Metal, Nickel, Hastelloy Alloys A-B-C, Ampco Alloy, Everdur). These valves are also available with flanged ends, with face-to-face dimension conforming to MSS SP42.

***The Complete Powell Line includes Globe, Angle, "Y", Gate, Check, Non-return, Relief, and Flush Bottom Tank Valves in Bronze, Iron, Steel and a wide range of Corrosion-resistant metals and alloys.**

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POWELL VALVES

upon installation from four sensitivity ranges to match the electrical resistivity of the fluid to be controlled. As a result, the control will discriminate between a liquid and its foam.

Type 10CB1 contains no vacuum tubes and operates with low voltage in the probe circuit. The control consists of an electrical relay operating from a probe circuit through a transformer and a rectifier.

• A laboratory or pilot plant **reduction crusher** is available from the Mine & Smelter Supply Co., P. O. Box 5270, Denver 17, Colo. It will reduce ½" feed to 10 mesh, single pass. Provides a product comparable to that obtained by commercial reduction crushers, an ideal feed for ball or rod mills; laboratory pulverizers; gravity concentration operations such as tables, jigs, sink float, or spiral concentration.

The new unit is 6" and 10", requiring ½ and 1 HP.

• The Davis Emergency Equipment Co., Inc., 45 Halleck St., Newark, N. J., is now making a new instrument, the Davis **halide meter,** for the toxic range analysis of halogen derivatives of hydrocarbons.

This new analyzer, originally perfected by DuPont, employs a photoelectric photometer to indicate changes in the intensity of the blue spectrum of a copper arc discharge in the presence of organic halide vapors.

The readings are accurate to within 10%, and the sensitivity increases approximately as the number of halogen atoms per molecule.

• A new **industrial rubber glove,** called "Griprite", of The B. F. Goodrich Co., Akron, O., is made with a roughened surface which is an integral part of the glove to insure a firm, tight grip even in the wettest application.

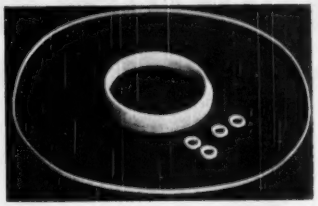
Made by the Anode process, the glove has curved fingers, is 14 inches long, identified by an orange band at the cuff, and made in sizes 9, 10 and 11 in black.

• Ingersoll-Rand Co., Phillipsburg, N. J., has introduced a new line of **gas - engine - driven compressors,** available in 110, 165 and 220 h.p., consisting of 4, 6, and 8 power cylinders respectively, with an 8¼" bore and a 9" stroke.

The JVG is a small, compact compressor of the I-R, 4 cycle, V-angle design, having the power connecting rods articulated with the compressor rods. It is a modern "Packaged" version of the first angle-type gas-engine-driven compressor originated by I-R in 1932. It now becomes part of the I-R, 4 cycle, V-angle line extending to 1320 hp.

• New **molded parts** made of "Teflon" are made possible through improvements in fabricating recently developed by The Connecticut Hard Rubber Co., 407 East St., New Haven 9, Conn.

These techniques give greater



density, less porosity, and permit the molding of large and rather thin pieces to closer dimensions than heretofore. These will be used for gaskets and seals in chemical and petroleum plants, in diesel and aircraft engines, and wherever particularly difficult conditions exist.

• A new **stainless steel sponge** is now available from the F. H. Langsenkamp Co., 227-35 E. South St., Indianapolis, Ind. It is used for rapid removal of scorching, film, and other foreign matter from tanks, coils, and kettles without scratching.

• The "Flow Tube" of Foster Eng'r. Co., Union, N. J., is essentially a differential producer which can be used with properly calibrated conventional recording, indicating, integrating, or control instruments to **measure and control fluid flow.**

The device consists of a short spool piece with an inner sleeve equipped with two groups of pressure nozzles, one set pointing upstream and the other downstream. These nozzle groups are interconnected by common pressure rings from which connections are made to the meter.

• A 12" OS&Y corrosion-resistant flanged **gate valve** for 150 psi at 500°F. (Primary Service Rating) is announced by The Pioneer Alloy Products Co., Inc., 16609 Euclid Ave., Cleveland 12, O., to round out Pioneer's corrosion-resistant alloy steel gate valve line, providing a complete range of sizes from ½".

• The Unit-Cool'd design of Elliott Co., Jeannette, Pa., introduces a totally new idea for the cooling of large enclosed **electric motors.** A finned tube air-to-air heat exchanger, comprising a single rec-

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- **PROCESS VESSELS**

OPERATING AT VACUUMS, LIMITED BY THE VAPOR PRESSURE OF THE CONDENSATE?

Many stills, dryers, evaporators, crystallizers and other processing vessels are operating at vacua limited by the vapor pressure of the condensate. This means on the average an absolute pressure of about 2.0" Hg. Most owners of such equipment do not realize how practical and economical it is to put a Booster Evactor in the line between the vessel and the condenser and maintain an absolute pressure of 0.5", 0.25" or even lower. The benefits of this higher vacuum in improving quality and capacity are often very substantial.

The steam jet type of vacuum pump has continually gained in favor for high vacuum in industrial process work. The total absence of moving parts is a big advantage and means many years of service, with no maintenance cost. Available in single, two-, three-, four- and five-stage units for vacuum from a few inches up to a small fraction of 1 m.m. Hg. absolute.

Croll-Reynolds have been specializing on this type of equipment for over 30 years, and have made thousands of separate installations. Their engineers have extensive experience in applying it to numerous different processes, and are available for consultation without obligation. Literature is also available on request.

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LIGHTNING PRODUCES FERTILIZER, TOO

Nature's fireworks—by transforming the inert nitrogen in the air to nitric acid — produce much more fertilizer per year than do Chemico-built plants. But lightning scatters its benefits without consideration for those who need them. Chemico-built plants, on the other hand, produce the kind of commercial fertilizer you want . . . where you want it . . . when you want it . . . in the concentration you want . . . at a very reasonable price.

Chemico offers a complete engineering and contracting service to the fertilizer industry, ranging from the design and construction of complete fertilizer works to furnishing small individual units and auxiliary plants of a specialized nature. From Pittsburgh to Pakistan, from Colombia to China, Chemico has been building such plants since 1914. Chemico brings to each new project a wealth of experience, proven methods and guaranteed performance.

If your plans include the production of nitrates, superphosphates, double superphosphates, ammonium phosphates, mixed salts or any other commercial fertilizers, it will pay you to discuss your specific problems with Chemico.

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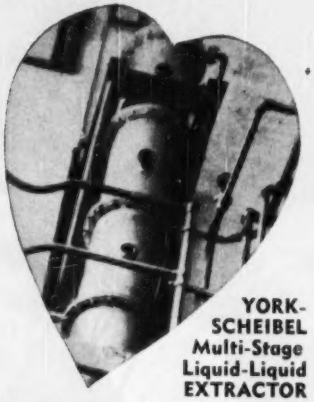

YORK-SCHEIBEL Multi-Stage Liquid-Liquid EXTRACTOR

The difference in molecular arrangement and consequent difference in concentration between two solvent solutions makes possible separation of structural isomers by the York-Scheibel Extractor. Thirty stages in a single column separate the eutectic mixture of o- and p-nitrochlorobenzene to 97% product purity! Recent work has shown mixtures containing 6 or more structural isomers can be separated!

Besides structural isomers, this York-Scheibel Extractor should be considered for effecting all separations where distillation cannot be employed conveniently or economically, as in the following:

- **Close-boiling mixtures**
- **Azeotropic mixtures**
- **Non-volatile mixtures**
- **Materials from dilute solutions**
- **Impurities and color-bodies**
- **Heat sensitive materials**

York-Scheibel Extraction Columns (patented) for laboratory, pilot plant and plant-scale operation can be made in practically any material of construction; with any number of stages to give the precise separation required.

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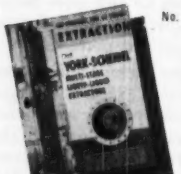

No. 12—The Practical Way of Solvent Extraction

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York OTTO H. YORK CO., INC.

ENGINEERS AND MANUFACTURERS — 71 GLENWOOD PLACE EAST ORANGE, N. J.

tangular unit, is located at the top of the welded-steel motor frame.

A fan draws cooling air from outside the motor, through the tubes, and out the front of the motor enclosure. Air within the motor is passed over the finned tubes, cooled and recirculated.

• A new low cost **metal instrument tubing** with a 1/32" coating of extruded thermoplastic is announced

by Samuel Moore & Co., Mantua, O.

Available in ¼" and ⅜" diameters, Dekoron tubing can be easily bent. The plastic coating also serves as color coding for the line.

• For those who use small quantities of cool and dry compressed air, Jas. A. Murphy & Co., Inc., Hamilton, Ohio, has made available a **line** of small, vertical **aftercoolers**, Type V-907.

The line comprises two sizes. The smaller size measures 30" overall and cools up to 20 cfm. The larger size measures 48" overall and cools 30 to 50 cfm. Air inlet and outlet pipe sizes up to 1" may be specified by the purchaser of either of the two units.

• A new series of **conductivity cells** has been designed to withstand extremely rough usage by Industrial Instruments, Inc., 17 Pollock Ave., Jersey City 5, N. J.

These new cells are constructed of 1" o.d. plastic with **flush** internal or external ring electrodes. Available as wand type, dip type, or equipped with a threaded fitting for pipe installations, they can be supplied in constants from 0.010 to 20.0.

• Developed primarily for the control of molten sulphur at 275° F. to rotary sulphur vaporizers in the sulphite pulp industry, the new **steam-jacketed flow control valve** of G. D. Jenssen Co., Inc., P. O. Box 401, Watertown, N. Y., is adaptable for flow control on thermoplastic materials.

Valve body is steam jacketed with a removable chrome nickel seat. It is actuated by a flanged diaphragm motor in conjunction with any standard air operated control instrument.

Available in ½" and ¾" sizes.

• A new heavy-duty **hammer mill**, an improvement over the Dollinger mill, has been developed by Daffin Mfg. Co., Lancaster, Pa. Both models, the H. M. 1250 and the H. M. 1650, have feed openings up to 239 sq. in.

Special feed rolls together with an extra finger feed roll handle fibrous materials. The transmission allows an instant change of speed for the feed rolls to adjust to materials being ground and power available. A sectional hinged hood and special screen release blocks permit easy change of screens.

• Penn Industrial Instrument Corp., 3116 N. 17th St., Philadelphia 32, Pa., announce new **air operated controllers.**

Unusual features: both nozzle and restriction have sapphire jewels to prevent wear due to dirt, water, or oil in the air. The nozzle is fixed with no adjustment possible. A restriction cleaning lever permits cleaning of the restriction while the controller is in service. The relay can be removed separately or with the entire control mechanism by breaking only one tube connection and removing four screws. The same relay is used for all types of controllers so that control action can be simply changed in the field.

• **Thermocouples** having speed responses up to nine times that of previous models have been developed by Minneapolis-Honeywell Regulator Co., Wayne and Roberts Ave., Philadelphia 44, Pa.

Increased speed of response has been made possible by three major improvements: (1) The mass of the hot junction is considerably reduced in the 8-, 14- and 20-gauge types; (2) The thermocouple wire is shaped to form a loop close to the hot junction. The insulator is faced about 1" from the welded tip, reducing conduction from the cold end; (3) The dimensions of the loop permit it to fit tightly inside a well, furnishing metal-to-metal contact, eliminating dead air space.

• Series 16 **ventilating fans** of Moore Co., 800 S. Missouri St., Marceline, Mo., are furnished in diameters from 3' to 5', with capacities from 11,000 to 30,000 cfm and provide exceptional performance against moderate static pressures.

The direct drive motor, designed for low speed fan operation, is completely enclosed within the hub and housing. Oversized, permanently sealed silicone-lubricated ball bearings require no further attention.

This unit is for handling lint or dust laden air. No outside air is circulated through the motor enclosure, all cooling being accomplished by heat transfer through the metal of the hub and housing. Fans may be constructed of any workable metal commercially available in sheet form.

NEW EQUIPMENT——

• Newly designed and carrying approval BM-2160 of U. S. Bureau of Mines for lead dusts, the No. L-800 **dust respirator** may be used for all known dusts which are not significantly more toxic than lead. A single chemically treated felt filter, 3 1/16" in diameter, provides low breathing resistance and low replacement cost. All metal parts made of aluminum, permitting face piece to be bent inward or outward to fit any facial contour. Has double rayon elastic headbands, patented rubber face cushion, knitted cushion covers.

• A new line of **sight glasses** made from Pyrex polished plate glass is available from the Swift Lubricator Company, Inc., of Elmira, N. Y. These glasses are intended for use as peephole and inspection windows

in installations where a heat resistant glass is desirable.

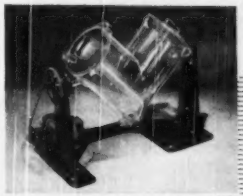
These sight glasses are all custom made to order. Circles are available up to 16" in diameter; with squares, rectangles and other odd shapes up to any size that can be made from a 24" x 60" maximum size plate. Sight glasses are available in thicknesses of 1/8", 3/16", 1/4", 3/8", 1/2", 5/8", 3/4", and 1". Glasses of 1/8" through 1/4" thickness can be furnished with either cut or ground edges. Glasses of 1/2" through 1" thickness are available in ground edges only.

• Goulds Pumps, Inc., Seneca Falls, N. Y., is producing a new line of **self-priming centrifugal pumps.** There is no large and bulky priming reservoir, no recirculation of water during pumping stage, and efficiencies comparable to standard centrifugal pumps. They are made in sizes from 1/4 HP to 5 HP, open and closed impellers. They have capacities up to 120 gpm and heads to 135 feet depending on capacity with suction lifts up to 25 feet.

• A new replaceable type **air filter,** the AMER-glas, made in all standard sizes has been introduced by the American Air Filter Co., Inc., 125 Central Ave., Louisville 8, Ky. The filtering media consist of continuous strands of glass filaments held together at each point of contact by a high-temperature plastic bond to form a resilient pad in a fiberboard casing between metal grills.

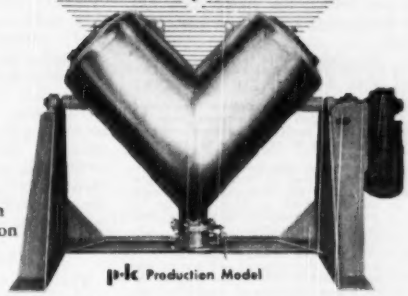
BOOTH 209
AT THE
CHEM SHOW

How to pare
the cost of
"PAIRING PARTICLES"
use a P-K
twin-shell blender



p-k Lab. Model
4- and 8-qt. capacities
Shells interchangeable

Faster blending
No baffles
No contamination
No particle breakdown
Low power consumption



p-k Production Model

Test blends, pilot runs, even ordinary blending of small and medium sized batches no longer need be costly. p-k Twin-Shell Blenders* pare costs to the minimum—insure a faster, more uniform blend.

p-k offers two laboratory or pilot size Twin Shell Blenders—4- and 8-quart sizes. Both are available with transparent plastic shells for visual inspection as the blending progresses. You can watch every stage of the gentle rolling and folding action that blends so thoroughly and quickly without attrition. Shells of stainless steel or other metals are also available.

The 4-quart blender is priced at $149.00; the 8-quart size at $159.00, F.O.B.—E. Stroudsburg. Delivery of standard units from stock. Production units are available in size from 1 to 300 cu. ft. capacity.

We will run test blends of your materials at no cost to you.

For complete information on these dry blenders, write for the p-k *Twin Shell Blender Catalog No. 401.*

*Patent pending

the P-K Patterson-Kelley Co., Inc.

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PACKAGING & SHIPPING

by T. PAT CALLAHAN

Color Seen as Secondary Means of Identifying Gas Cylinders

Any article on the use of color to identify compressed gas cylinders is bound to be controversial. CI's editors consider the following discussion entitled "Use of Color on Gas Cylinders," by Frank R. Fetherston, secretary-treasurer, Compressed Gas Association, Inc., an excellent presentation of the subject, and appreciate the Association's making it available for publication.

The Compressed Gas Association believes that the primary and positive method for determining the content of compressed gas cylinders should be by use of the written word, applied to the container in a manner that will assure its legibility.

The standard adopted by the American Standards Association and which is the method of cylinder content identification accepted by the compressed gas industry, is an elaboration of the principles which the Association has consistenly supported. It is quoted as follows:

American Standard Method of
MARKING COMPRESSED GAS CYLINDERS TO IDENTIFY CONTENT

Specifications for marking portable compressed gas cylinders so that their content may be readily identified to the extent necessary to prevent the probability of explosions or accidents from their misuse.

1. Compressed gas cylinders shall be legibly marked for the purpose of identifying the gas content, with either the chemical or the trade name of the gas. Such marking shall be by means of stenciling, stamping, or labeling, and shall not be readily removable.

2. Whenever practical, the marking shall be located on the shoulder of the cylinder.

3. The height of the lettering shall not be less than one twenty-fifth (1/25) of the diameter of the cylinder, with a minimum of one-eighth (⅛) inch.

4. Attention is called to the Interstate Commerce Commission Regulations for Transportation of Explosives and Other Dangerous Articles by Rail and Water in Rail Freight, Express, and Baggage Services and by Motor Vehicle (Highway) and Water; to the Food and Drug Administration Regulations for the Enforcement of the Federal Food, Drug and Cosmetic Act; and to the National Bureau of Standards Simplified Practice Recommendation R 176-41, Color Marking for Anaesthetic Gas Cylinders.

The proponents of color coding do not seem to be satisfied with the American Standard method, and the question of reverting to the use of color finds its way into the meetings of safety groups, government agencies, societies of various kinds with limited interest in the field of compressed gases, laboratory technologists, anaesthetists, and similar groups whose opinions reflect a limited point of view when considered in the light of the broader fields of use for all of the compressed gases. There are about 100 compressed gases that are shipped or stored in the types of cylinders that are referred to in this discussion, and there are only 7 primary colors. This means that in order to utilize color for gas cylinder identification purposes, color combinations would have to be employed. Also, various shades of the same primary color would have to be used.

Such use of color would also introduce additional possibility of error in the determination of cylinder content, for several reasons. The people who use compressed gases would have to learn what the various color combinations mean. This involves a matter of education, the effectiveness of which would vary with the respective abilities of the students. Even if each one had the same degree of color perception there would be a wide variation in the accuracy with which a color coding system would be translated. And we know that people do not all have the same degree of color perception. In fact many people are totally color blind.

We have knowledge also that painted cylinders utilized in locations where they were exposed to impure industrial atmospheres have actually changed color due to reaction of the polluted atmosphere with the cylinder paint. And while this is an unusual circumstance it is eliminated as a source of error if the color on the container is not utilized to denote its content. It may also be noted that shades of color vary considerably under different kinds of light such as mercury vapor and fluorescent lights.

Color Has Place

The use of color on cylinders certainly has its place and is essential to good housekeeping, especially as a company matter. Color, however, should only be used for *secondary* purposes such as segregation or ownership identification. It should not be used as a primary method for content identification. There is only one instance where color is utilized with the concurrence of the gas manufacturers for selective purposes. The medical gas industry has subscribed to a practice of applying a color area to the shoulder area of the small medical gas cylinders used exclusively for anaesthetic purposes. This practice is covered in Simplified Practice Recommendation R 176-41, "Color Marking for Anaesthetic Gas Cylinders" of the National Bureau of Standards of the U. S. Department of Commerce. It applies only to the cylinders which approximate 4½" diameter by 26" long, and to a very limited number of gases, 8 gases or combinations of these gases to be exact.

It might seem on the surface that acceptance of this practice by the medical gas industry is in contradiction to the broad principles to which the Compressed Gas Association subscribes. Such is not the case, however. All medical gas cylinders are marked or labeled for content identification as a requirement of the Federal Food and Drug Act. This fulfills the recommendation for the use of the written word as the only acceptable means for primary identification of cylinder content. The application of color is therefore secondary, and in the case of the few anaesthetic gases mentioned, serves a useful and practical purpose.

In companies where a variety of gases are produced it is customary for each to have a color system of its own. But such color coding is used for segregation purposes, for the facilitating of storage, for container ownership identification, and for plain good housekeeping and maintenance practices.

Now, here is how the gas user can help to overcome the complaint that gas cylinders are not marked satisfactorily to identify their content. Do not accept delivery of cylinders of gases unless they are clearly and legibly marked with the name or trade name of the gas contained. The gas supplier is the fellow to talk to about it, and it will be found that he has a deep and sincere desire to have his product utilized with sound judgement, care, and understanding. Mistakes make accidents, and accidents are fatal to any industry.

Second Barge Built for Sulfuric Acid

Based on the performance record of the first welded steel tank barge ever designed and built specifically for transporting sulphuric acid on the inland waterways, a second barge

View down centerline of sulfuric acid barge along inspection walkway. Tanks are strapped in hardwood-lined steel saddles. Total load of 865 short tons can be pumped out in 3½ hours.

FOR BETTER PROTECTION ON HARD-TO-PACK PRODUCTS

use St. Regis Plyolene Multiwall Paper Bags

Markets for many food and chemical products these days are being won or lost by the margin of a few cents per hundred-weight in production cost. Lower costs spell larger sales.

- The decisive cost difference may be gained for your own hard-to-ship products by packing them in St. Regis Plyolene Multiwalls. Their Polyethylene ply-coating protects the contents.
- St. Regis Plyolene Multiwalls are actually saving many manufacturers up to 46 cents per cwt. by their combined economy in price—lower storage, freight, packing and handling costs—and lower container tare-weight.
- These specialized St. Regis Multiwall Paper Bags were developed for products requiring high resistance to oil, grease, moisture, alcohol, alkalies and most acids. The coated ply is an inner layer—inert, odorless, non-toxic. It gives even greater strength to the tough St. Regis kraft Multiwall.
- *Your nearest St. Regis Sales Office can give you specific answers on the suitability of Plyolene Multiwalls and their saving in costs.*

Visit Booths 114-115-116
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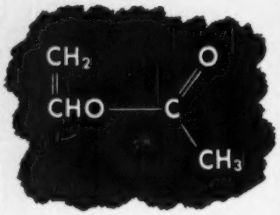

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71.8° to 73°C.

Vinyl Acetate can be polymerized to form resins with exceptional bonding qualities for wood, glass, metal and fibre.

Vinyl Acetate can be used for synthesis of a-b-dichloroethyl acetate, b-monochlor ethyl acetate, b-chloro acetals, 2-aminothiazole, chloroacetaldehyde and many others.

Containers: —

410 lb. drums

62,500 lb. tank cars

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CHEMICALS DIVISION
UNITED STATES VANADIUM CORPORATION
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of the same type has just been placed in service by Consolidated Chemical Industries, Inc., Houston, Tex.

Both vessels were designed and built for Consolidated by Dravo Corp., Pittsburgh, to solve a difficult transportation problem — moving large quantities of sulphuric acid safely, economically and speedily on the waterways. The barges operate mainly between Consolidated's plants, customers' terminals and trans-shipment points along the Intracoastal Canal in Texas and Louisiana and the Mississippi River.

The problem of transporting sulphuric acid in bulk quantities was simplified because of the proximity of the Intracoastal Canal and other waterways to loading and unloading points.

One difficulty that had to be overcome was possible corrosion damage to the steel barge through acid spillage. Although sulphuric acid is not corrosive in the concentrated form in which it is shipped, spilled acid could be diluted by bilge water to become extremely corrosive. A departure from the conventional design of chemical barges provided the solution. This entailed decking over the entire vessel with outboard-sloping watertight steel plate. Thus, rain or spray cannot get into the hull and spilled acid can be readily washed overboard with a hose. The deck camber is 3 inches in 15 feet.

Sulphuric acid is carried in two cylindrical steel tanks cradled side by side longitudinally in the hold of the barge. Together the tanks hold 865 short tons, approximately 114,000 gallons, of concentrated sulphuric acid (66° Be.). Each tank is 8½ feet in diameter by 135 feet long, braced internally with four steel spiders spaced equal distances apart. The tanks have been so constructed as to provide a slight downward slope from the ends to the midpoint, where a pump sump is located, enabling virtually complete removal of the cargo. The tanks are held in hardwood-lined steel saddles by eight metal straps.

The large tanks minimize the amount of piping required on the barge. Moreover, they help reduce cargo discharge time. Two electrically-driven high speed pumps of special design are installed on the barge to discharge the acid. The load can be pumped out in approximately 3½ hours.

The barges are 175 feet long, 30 feet wide and 10 feet 8 inches deep. Side decks are 3½ feet wide to provide ample working space for the crew handling mooring and cargo lines.

The barge draws 2 feet 4 inches, light, and with a full cargo of 865 short tons has a draft of 8 feet.

Because of the extreme length of the tanks, it was not possible to install a transverse bulkhead in the barge midsection. Rigid steel rod cross struts are used for bracing in this section. Two transverse bulkheads separate the forepeak and after peak from the cargo tank compartment.

Like the first barge, the second has a 2-foot wide walkway between the two acid tanks for inspection purposes. Temporary fans are installed in the hold to provide better ventilation during repair and maintenance work and inspection.

Outdoor Area Added to Materials Handling Show

The fourth National Materials Handling Exposition, which in three years grew to rank among the five largest industrial shows in the country, will be held in the International Amphitheatre, Chicago, April 30 to May 4, 1951.

The Materials Handling Institute will sponsor the exposition. Concurrently with the show, a conference will be conducted with nationally-known experts leading the discussions on new techniques in materials handling and related fields.

Outstanding among the innovations of the next show will be the addition of a large outdoor area to permit demonstrations of yard handling equipment, not previously possible when the exhibits were confined to indoor areas.

New Marking Device

A new device called Mar-Kit is being made and sold by the B & I. Manufacturing Co., 3512 North Halsted Street, Chicago 13, Illinois. It is a disposable marking unit for use in shipping rooms, sign shops, mail rooms and other offices and plants where there are frequent uses for black heavy lettering.

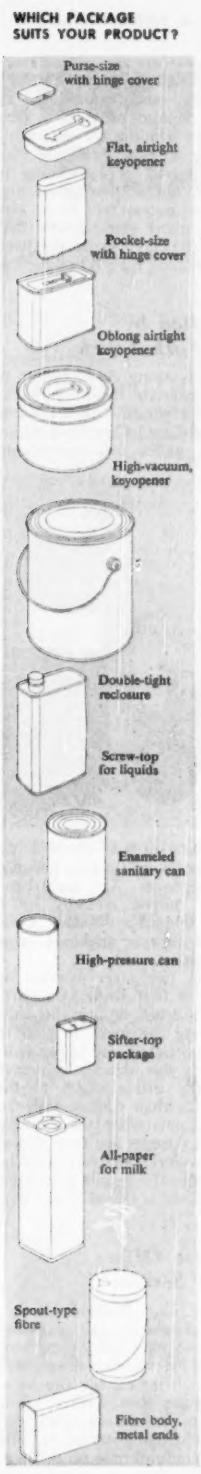
Mar-Kit is a self-contained lettering unit, a complete felt-point pen in itself with this important difference—when the ink supply is exhausted, the empty bottle is discarded and a fresh bottle of ink attached right onto the old writing assembly.

The ink is a specially compounded formula that writes dry, does not become sticky in the bottle and is ready for instant use at all times. It works well on all surfaces—wood, paper, steel, fabric, etc. Depending on the smoothness of the surface, the felt point will outlast several bottles of ink.

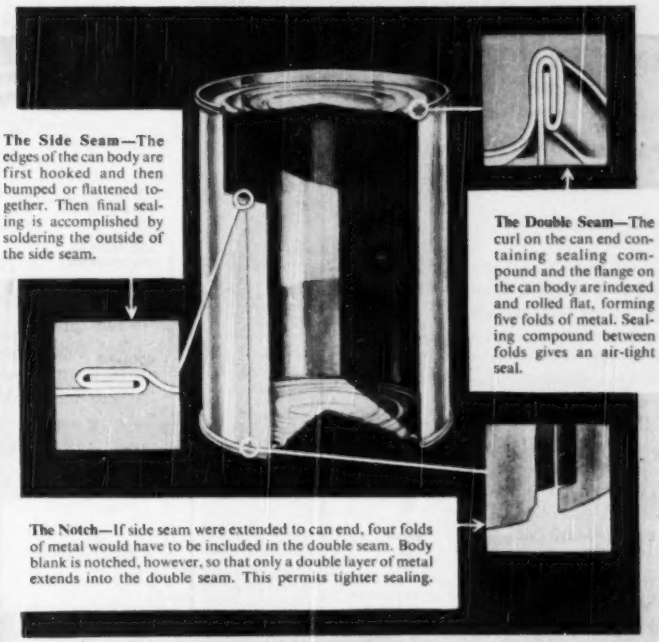
Steel Drum Reconditioning Subject of Bulletin

A new bulletin "How Wheelabrator Blast Cleaning Simplifies the Reconditioning of Steel Drums," of interest both to those who recondition steel drums, and to those who use steel drums, is available from American Wheelabrator and Equipment Corp., S. Byrkit Street, Mishawaka, Ind. The 4-page bulletin illustrates and describes the equipment and methods of cleaning the interior and exterior of drums as well as drum lids.

Some of the advantages of this process are said to be these: (1) better appearance inasmuch as paint, rust,



Architecture of the enameled sanitary tin can


The Side Seam—The edges of the can body are first hooked and then bumped or flattened together. Then final sealing is accomplished by soldering the outside of the side seam.
The Double Seam—The curl on the can end containing sealing compound and the flange on the can body are indexed and rolled flat, forming five folds of metal. Sealing compound between folds gives an air-tight seal.
The Notch—If side seam were extended to can end, four folds of metal would have to be included in the double seam. Body blank is notched, however, so that only a double layer of metal extends into the double seam. This permits tighter sealing.

The busiest package in America today

No basic package offers more profit advantages to so many manufacturers.

It moves more food to market than any other container.

Beans and beer; soups and sausages; oils, orange juice or combustion capsules—hundreds of products come to you from your dealers' shelves, fresh and ready, in this sanitary, enameled metal can.

New uses for it are born every day. Maybe a cake mix, or a carbonated drink, or expensive cigars.

Perhaps it's the answer to *your* product's greater success. Whether you now package in glass, paper, fibre or plastic, you owe it to your sales quota to take a look at this versatile carrier.

You can pack it under high-heat or low-cold. You can lithograph it in handsome, come-hither designs.

It keeps air out; can be had in 12 special linings to protect your product's quality, flavor, freshness, and shelf-life. Fills fast; won't break, sift or spill; and you can get it in 179 sizes from tiny 2-oz. to burly 162-oz. Your dealers love its stackability; their customers know it, have faith in it.

Why not let *your* packaging experts get together with *ours*?

We'll help you with your labels, give you cost-cutting ideas and sales-building advice on processing, filling, closing.

Since 1901, Canco has led in packaging.

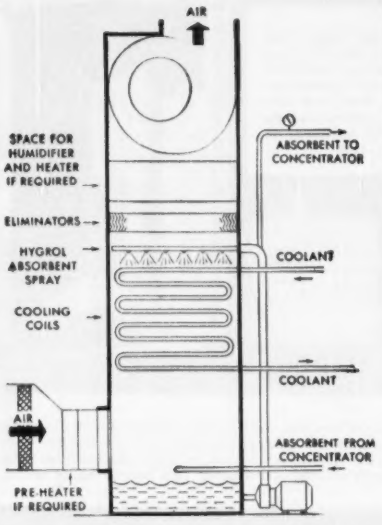
New Method Gives Precise Control in Air Conditioning

Niagara "Controlled Humidity Method" Uses Hygrol, Hygienic Liquid Absorbent

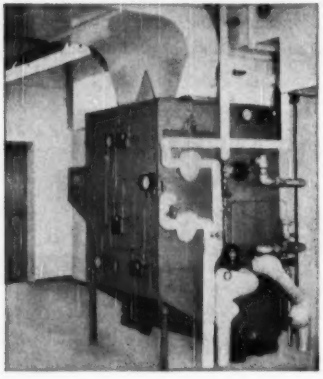
● The Niagara "Controlled Humidity Method" is a new system of air conditioning giving complete control of temperature and relative humidity, holding constant conditions or varying them at the will of the user. Especially, it provides dry air at normal atmospheric temperatures with little or no refrigeration required. A condition of 15 grains of moisture per pound of air at 85 deg. F. dry bulb temperature has been produced without refrigeration.

The apparatus is enclosed in a casing thru which the air is drawn by fans. The air is filtered and then enters a chamber where it is dehumidified in passing thru a spray of "Hygrol" Liquid (a hygienic hygroscopic chemical that absorbs the air-borne moisture and contains no salts or solids to precipitate) In the same chamber are located cooling coils which remove the latent heat of evaporation and also sensible heat as required.

The absorbent liquid spray falls into a tank at the base, where it is piped to a concentrator, removing moisture taken from the air. The re-concentrated liquid returns to the system. This process is continuous, and the apparatus operates at full capacity at all times.



NIAGARA CONTROLLED HUMIDITY METHOD — FLOW DIAGRAM



The same equipment may be used to provide winter air conditioning when required, by installing a tempering coil at the outdoor intake, an humidifier, and a reheat coil above the eliminators.

This equipment is manufactured in a range of sizes providing from 1000 to 20,000 CFM of conditioned air from a single unit, and mutiple unit installations are practical. It is expected that, by reducing the need for refrigeration, the cost of air conditioning will be reduced by this method. Applications generally are in a temperature range from 35 deg. F. upward. Below the freezing temperature of water, the Niagara "No-Frost" method is applicable.

The equipment is protected by U. S. and foreign patents. Installations have been made in food and chemical process industries, in packaging hygroscopic products, for preventing condensation of moisture on metals and other products in storage, in air conditioning for laboratory control and for human comfort.

For further information, write Niagara Blower Company, Dept. CI, 405 Lexington Ave., New York 17, N. Y.

and previous coatings are scoured away down to the bright, clean metal; (2) the finely etched surface, produced by the scouring action, provides a perfect anchor for bonding the protective coating to the metal; (3) rust and corrosion are deterred; (4) cleaning is faster; and (5) less labor, space and equipment are necessary. It is also claimed that many steel drums that otherwise would have to be scrapped can be salvaged by Wheelabrator cleaning.

Drums Lifted by Versatile Fork Truck

A new time-saving development to help speed materials handling operations are the Hydraulic Drum Forks of Towmotor Corp., Cleveland, Ohio. All ordinary pallet fork operations,

plus the handling of steel drums without pallets, can be easily accomplished with the new forks. The right-hand fork can be moved laterally by a double-acting hydraulic cylinder, while the left hand fork is anchored in a stationary position.

To pick up two steel drums, the movable fork is first shifted outward, then the lift truck approaches the drums, allowing the forks to pass to either side and below the upper rolling rings of the drums. Concave notches on the inside edges of the forks then make close contact with the sides of the drums when the movable fork is closed. Drums are then picked up between the forks and supported by the rolling rings. To handle other type pallet loads, forks are used in the normal manner.

Drug House Offers Packaging Service

The Arner Co., Buffalo, N. Y., pharmaceutical house, has extended its activities to packaging and bottling for allied fields. Expanded packaging facilities enable the company to initiate this service while maintaining its production of various medicaments for the drug trade. The company will extend help on packag-

HOW TO DROP $10,000.00

and not lose a cent

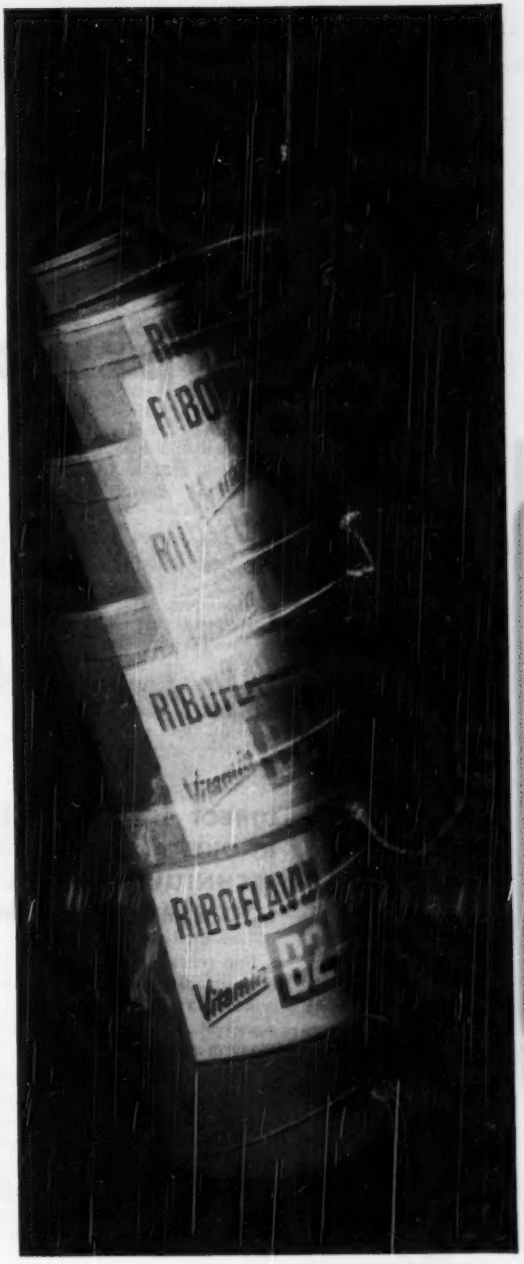
If you shipped riboflavin—a widely used vitamin—the very thought of somebody dropping one of your shipping drums would give you gray hairs. A single drum of riboflavin is worth upwards of $10,000. But one of Continental's regular line of shipping drums—the Leverpak drum—is the choice of many companies for safeguarding their most valuable products.

The stroboscopic photograph at the right shows a Leverpak drum containing four hundred pounds dropping four feet. It didn't leak, shatter or fracture. *Not a penny's worth of the contents will be lost!*

This Leverpak drum is just one example of Continental's ability to develop packages to meet exacting requirements. Like all Continental drums, it is light in weight to save shipping costs, and can be furnished in a wide variety of linings and coatings.

Whatever your product, Continental can supply you with a package that will stand up in service, stand out in appearance. Continental is famous for its fine lithography and decorative work. Drum, can, or paper container—if you have a packaging problem, our technical staff is ready to help you solve it. Continental is big enough and flexible enough to handle any packaging situation.

DRESS UP YOUR PRODUCT WITH A CONTINENTAL DRUM. Three types to choose from. The Leverpak drum, with its unique lever-locking device, for maximum protection under hard usage. 12- to 75-gallon sizes. . . . The Fiberpak drum—a rigid, light, all-fibre container in ¾- to 67-gallon sizes. . . . The Stapak drum with fibre body and metal top and bottom. Supplied in 2- to 32-gallon sizes.



CONTINENTAL CAN COMPANY

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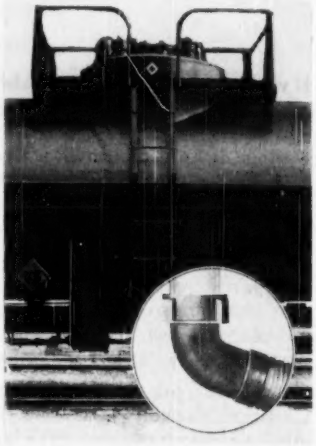
ing problems to manufacturers of foods, soaps, powders and liquids, etc.

Light Elbow Coupling for Tank Car Unloading

Unloading tank cars containing petroleum products or liquid chemicals will be less burdensome and much faster by use of a non-ferrous elbow



coupling introduced by the Atlantic Metal Hose Co., Inc., 123 West 64th Street, New York 23, N. Y.

The non-ferrous coupling is 66% lighter than the malleable iron coupling now in general use. A typical 4″ malleable iron coupling weighs 15 pounds. A 4″ non-ferrous coupling weighs only 4¾ pounds. This allows one man to affix the coupling and eliminates the use of heavy, unwieldy wrenches. In addition, this coupling possesses high tensile strength and non-sparking qualities.

Printed Polyethylene Bags

With the addition of new machinery in its factory at Minneapolis, Bemis Bro. Bag Co. is now offering color-printed polyethylene bags in a wide variety of shapes and sizes. Attractive brand-printing, in from one to four colors, plus the transparent quality of the polyethylene make striking consumer packages possible.

New Membership Available In Packaging Institute

A new form of membership in the Packaging Institute, 342 Madison Ave., New York 17, N. Y., to be known as Associate Membership has been announced by its president, C. L. Barr. The associate membership has been created to permit individuals in member corporations to benefit from the work of the Packaging Institute at the low dues of $15.00 a year.

Chase Expands Production Of Special Multiwalls

The all-crinkled multiwall paper bag continues its expansion with Chase Bag Co.'s new installation at its St. Louis plant for the production of Sharkraft bags, the company's new name for this container. The company states that new equipment installed is the first to be specifically designed and built for the all-crinkled multiwall bag.

All-crinkled and "crest-ply" laminated paper bags were a post-war development, first produced in commercial quantities in 1946.

Although it resembles a regular smooth multiwall in style and construction, the all-crinkled multiwall bag's design gives it inherent longitudinal stretch. This quality is the result of using so called "wet creped" or secondary creped paper, containing approximately 12% to 15% stretch in the individual ply construction. Three, four and five wall bags are produced by laminating the individual walls of crinkled paper together with a light coating of pliable adhesive. The outstanding feature of these bags is their ability to expand and absorb unusual shock and strain that would burst ordinary paper bags.

Further advantages claimed for Sharkraft bags are their excellent stacking qualities. The crinkling process imparts a deep grooved, "non-skid" outside surface and makes it possible to stack bags 30 or 40 high without danger of sliding or toppling. Furthermore, the crinkling process makes the bags soft and flexible.

To date, 50 pound and 100 pound units have been widely accepted in such industries as starch, salt, various types of animal feed, refractory cement, dry adhesive, powdered milk, meat scraps, tankage and many other products.

Film Shows How to Handle Freight Safely

Freight Handling Safety, a new training film showing how to handle and unload freight safely has just been produced by the National Safety Council. In story form, it shows through a character called "Happy Jack" the safe way to open a freight car door, lower a dock plate into position and anchor it, and how to handle "sleepers."

Freight Handling Safety is available from the Council in the usual 35 mm sound slide film and in a 16 mm film for sound-motion projectors.

Prices for outright purchase, preview or rental may be obtained on request to the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

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LABORATORY EQUIPMENT

Laboratory Mixer

New mixer breaks up whirlpool action, produces both horizontal and vertical mixing.

Whirlpools are not very effective in producing mixing action, according to Dr. Bronislaw Goldman who has perfected a new type of laboratory mixer now manufactured by

Fisher Scientific Co., 717 Forbes St., Pittsburgh, Pa. The new mixer is designed specifically to break up whirlpool action to produce both horizontal and vertical mixing in as little as one-tenth the time previously required. It can be used for liquid-liquid, liquid-solid, or liquid-gaseous dispersions.

The Fisher-Goldman mixer employs the slightly curved, rotating paddles (adjustable for different viscosities) to effect the actual agitation. However, the principal difference between this and ordinary stirrers, is that three baffles, freely suspended in the liquid, are added to break up the whirpool action.

The laboratory mixer has a Pyrex jar of 3½ gal. cap. with easily removed stainless steel parts. The 1/6Hp motor can be obtained for either 115 or 230 volt operation. The paddles are rotated at a speed of 275 rpm.

Infrared-Transmitting Glass

Arsenic- and sulfur-containing glass is easily moldable, transmits infrared.

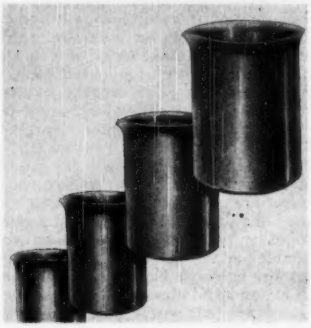
A Northwestern University physicist has developed a new type glass which can be easily molded and also has the ability to transmit infrared rays of extremely long wave lengths. Arsenic, combined with **sulphur,** forms the new reddish-colored glass.

One anticipated use is in lenses for infrared spectrographs. Now, different kinds of natural or artificial crystals, such as quartz or rock salt, are used. But the size of the optical parts made from these crystals is limited because the lens and prisms have to be cut and ground from the available stock.

The new glass can be easily molded as it has a melting point below 300° C.

The new glass can be produced to transmit different regions of the infrared spectrum. For example, by changing its composition it can be made entirely opaque to block out all visible rays while still transmitting infrared rays.

Stainless Steel Beakers



Beakers with a lip which provides a steady flow with no after-drip are now being fabricated in a range of sizes by Arthur S. La Pine & Co., 121 W. Hubbard St., Chicago 10, Ill.

• A new **high speed centrifuge,** developed by Precision Scientific Co., 3737 Cortland St., Chicago 47, Ill., operates at 5000 rpm both for semi-micro and micro qualitative analysis. The six tube head is totally enclosed with each tube in a separate compartment, a valued feature when centrifuging such volatile products as ether.

A rheostat control provides speed control from 1800-5000 rpm in unbroken sequence. Developing 1/20 HP, the series wound motor operates on standard 115 volts AC to deliver 5000 rpm—up to 20% high speeds on DC.

• A new "portable" **lead shield** designed for use in carrying or storing radioisotopes in standard 30 cc vaccine or glass stoppered bottles is available from Atomic Instrument Co., 160 Charles Street, Boston, Mass.

The new shield, designated Model 805, has aluminum inner and outer shells and provides a 1" minimum lead wall thickness in all directions. For added strength and durability, the carrying handle is cast as an integral part of the top cover. The positioning of the locking lugs for the shield prevents contamination as it is impossible for the cover face to lie against flat surfaces.

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The Heterocyclic Derivatives of Phosphorus, Arsenic, Antimony, Bismuth, and Silicon, by Frederick George Mann. Interscience Publishers. New York; ix + 180 pp.; $5.25 ($4.20 to subscribers for the entire series).

THIS IS the first volume to appear of a series of monographs devoted to a modern detailed and comprehensive presentation of heterocyclic chemistry by a group of authorities. Subdivisions have been designed to cover the field in its entirety by monographs which reflect the importance of the various compounds.

Organic Chemistry, by G. Bryant Bachman. McGraw-Hill, New York; x + 432 pp., $4.25.

THIS TEXT is intended for use in a full year's course in organic chemistry, but it may be used in a shorter course. It is designed especially for non-chemistry majors. The author presents those applications and generalizations of the subject which may be learned and retained more easily than long lists of facts. Features include systematic naming of organic compounds and emphasis on the electronic concept of valence.

Advances in Catalysis (Volume II) edited by W. G. Frankenburg V. I. Komarewsky, and E. K. Rideal. Academic Press Inc., New York; xi + 292 pp., $6.80.

IN THE second volume of this series, the editors have continued their efforts to present the many facets of the catalytic process. Lack of a complete understanding of catalytic action and inability to predict the best way of achieving a desired catalytic reaction, make it indispensable for everyone working in this direction to familiarize himself with the experience of others, even if such experience was gathered in remote sectors of this vast field. Volume Three of this series, incidentally, is in preparation.

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Organic Synthesis (Volume 29) editor-in-chief, C. S. Hamilton. John Wiley & Sons, Inc., New York; vi + 119 pp., $2.50.

THE CURRENT volume continues the excellent annual series of checked preparations of selected organic compounds. The index in this volume covers volumes 20 through 29. Syntheses of the following compounds are included: 1-acetylcyclohexene; acrylic acid; m-aminobenzaldehyde dimethylacetal; 5-amino-2,3-dihydro-1,4-phthalazinedione; β-benzoylacrylic acid; α-bromoheptaldehyde; *tert.*-butylamine and *tert.*-butylamine hydrochloride; Raney nickel; 4-chlorobutyl benzoate; 2-chloromethylthiophene; γ-chloropropyl acetate; 2,6-dichlorophenol; α,α-diphenylacetone; ethyl β-anilinocrotonate; ethyl 2-pyridylacetate; 1-ethynylcyclohexanol; homophthalic acid and anhydride; β-(2-hydroxyethylmercapto)propionitrile; indazole; isoprene cyclic sulfone; methacrylamide; *m*-methoxybenzaldehyde; 1-methylaminoanthraquinone; 1-methylamino-4-bromoanthraquinone; 2-methyl-4-hydroxyquinoline; *m*-nitrobenzaldehyde dimethylacetal; *p*-nitrobenzonitrile; 5-nitro-2,3-dihydro-1,4-phthalazinedione; oleyl alcohol; α-phenylcinnamonitrile; protocatechuic acid; 2-thiophenealdehyde; 1,2,5-trihydroxypentane; and trimethylene oxide.

Outlines of Biochemistry, edited by R. A. Gortner, Jr., and W. A. Gortner. John Wiley & Sons, Inc., New York; xvi + 1078 pp., $7.50.

SINCE ELEVEN years have elapsed since the last edition of Professor Gortner's well-known text, the new third edition represents considerable rewriting and expansion. Chapters have been added on protein denaturation, carbohydrate metabolism, and lipid metabolism. Chapters on vitamine, protein metabolism, and the polysaccharides have been expanded. Material on flavins, osmotic pressure ,electrical conductivity, and colloids has been condensed.

Safety in Petroleum Refining and Related Industries, by George Armistead, Jr. Security Publishing Corporation, Washington 6, D. C.; 1950; 416 pp., $10.

THE STATED objective of this book is to make available within a single cover a summary of practical basic fundamentals applying to plant safety in petroleum refining and related portions of the chemical industry. In pursuing this objective, the author has dealt only briefly with the generalities of the

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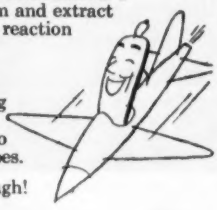
AMMONIA: Yes, and I serve as a protective atmosphere to surface-harden and anneal vital parts of planes and automobiles. I neutralize acid in petroleum and extract metals from ores. I'm a solvent and reaction medium in organic synthesis, a nutrient for yeast and a processing agent in the manufacture of alkalis, rayon, dyes, butadiene, and catalysts for cracking petroleum. I'm used in making vitamins, sulfa-drugs and radio and television parts and tubes.



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subject of safety, spending most of the time mainly with specific fields such as fire fighting, inspection, tank cleaning, toxic hazards, and other phases. Obviously, such a broad field as this cannot be covered in a single volume but the author has crammed a great deal of useful information into its 400 pages by means of excellent illustrations and much tabular data. An extensive section is devoted to safety inspection of process and other equipment to assure against unexpected failure. Here, the author has discussed many of the latest types of inspection equipment which now permit the wall thickness of vessels to be determined by non-destructive testing.

The Practice of Research in the Chemical Industries, by R. H. Griffith. Oxford University Press. New York; vii + 184 pp., $3.25.

THE AUTHOR, who is senior research chemist of the North Thames Gas Board, delineates the relations between a research department and other sections of an industry; the factors which affect the choice of site, structure and equipment; selection of the staff; evolution and execution of the research program; and methods by which experimental work is actually carried out. Attention is given to ways in which output and application may be influenced, and the balance between fundamental and applied research is considered.

General Chemistry, by Harry N. Holmes. The Macmillan Co., New York; viii + 708 pp., $4.50.

THE FIFTH edition of this text keeps pace with the rapid changes in theory, and their application to industry, that have taken place since the appearance of the previous edition in 1941. Attention is accordingly given to nuclear chemistry and the related theories of valence and ionization. Industrial applications are brought up to date with special emphasis on synthetic rubber, the synthetic fibers, plastics, petroleum chemistry and the newer synthetic drugs.

Chemical Engineering Plant Design, by Frank C. Vilbrandt. McGraw-Hill Book Co., Inc., 3rd Ed., New York; 608 pp., $6.

DR. VILBRANDT has greatly expanded this standard work, adding some 156 pages to the preceding edition. Much of this space has been taken up by an expansion of the chapter on preconstruction cost estimating. Here old cost data have been replaced by postwar figures and at the same time the sections covered have been expanded appreciably.

Information concerning various cost indices has been included to enable users of the book to project

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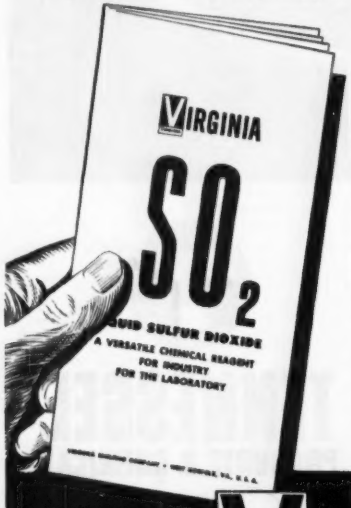

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INDUSTRY'S BOOKSHELF——

cost estimates for several years. Also, new material has been added to the chapter on development with particular attention being paid to pilot plants and their functions.

The illustrative example used in the preceding editions referred to a ferrous sulfate recovery plant. This has been deleted and replaced by a new and more complete example — a benzene hexachloride unit.

Industrial Electrochemistry, by C. L. Mantell. McGraw-Hill Book Co., New York; 1950; 781 pp., $8.50.

THE THIRD EDITION has extensive revisions and additions to bring this subject up to date. As in the earlier editions, the technology of the electrochemical industries is emphasized rather than specific physicochemical aspects. Good drawings and pictures aid in the presentation and provide comparison of the various types of cells for the electrorefining of metals, electrolysis of water electrolytic formation of caustic soda and chlorine, fused salt electrolysis, electrolytic oxidation and reduction, and for production of various non-metallic electrothermal products. A section on the electrochemistry of gases is also included.

The Chemistry of Industrial Toxicology, by Hervey B. Elkins. John Wiley & Sons, Inc., New York; 1950; 406 pp., $5.50.

RATHER THAN being concerned primarily with the physiological effects of poisons, the emphasis of this book is on the industrial aspects of their production, harmful effects, maximum allowable concentrations, and best methods of determining whether a danger is present. A detailed study of over 200 industrial poisons is offered. Dr. Elkins then turns to the processes which produce toxic materials to analyze the toxic danger involved. Much of the material is summarized in tabular form for easy use. The last part of the book tells exactly what equipment is needed to test for toxic materials and what procedures should be followed for the detection of 64 substances in air and 12 in urine.

Principles of Organic Chemistry, by James English, Jr. and Harold G. Cassidy. McGraw-Hill, New York; xiii + 512 pp., $4.50.

DESIGNED FOR USE in a full year's course in organic chemistry, this text stresses the fundamental principles of the science for students planning to go on to advanced scientific work in medicine, chemistry, chemical engineering, and allied fields. The authors have left out much detailed material often found in beginning organic texts, preparing a selected body of factual and theoretical material and showing how this carefully chosen material,

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Forest Products — Their Sources, Production, and Utilization, by A. J. Panshin, E. S. Harrar, W. S. Baker, and P. B. Proctor. McGraw-Hill, New York; ix + 549 pp., $6.

THIS TEXT is a broad introductory treatise which presents in concise form information on the origin, methods of conversion, and utilization of the principal primary and secondary forest products. The text is divided into four major sections: Economics of Forest Utilization; Wood Products; Chemically Derived Products from Wood; and Derived and Miscellaneous Wood Products. Special emphasis has been placed on all recent developments and trends.

The Chemical Elements and Their Compounds (in two volumes), by N. V. Sidgwick. Oxford University Press, New York; xxxii + vi + 1703 pp., $14.

THESE VOLUMES ARE an attempt to describe the chemistry of the elements in the light of modern ideas of atomic and molecular structure, and to show how far the facts can be converted from a mass of unrelated data into a coherent whole. It deals with the elements in their periodic groups, and describes their more important compounds, with the evidence for their structures; the changes of properties which occur within the groups, and between one group and another, are emphasized. The analytical, metallurgical, mineralogical and technical details are kept in the background. The book is fully documented and liberally indexed.

Fundamentals of Organic Chemistry, by J. B. Conant and A. H. Blatt. The Macmillan Co., New York; ix + 413 pp., $4.

THIS BOOK is not a new edition of the authors' well-known "Chemistry of Organic Compounds". While some material has been drawn from their earlier book, most of it has been rewritten and simplified for first-year students of organic chemistry who do not plan to continue to become professional chemists. Thus this simplified version stresses those topics of practical interest.

Quantitative Ultramicroanalysis, by Paul L. Kirk. John Wiley & Sons, Inc., New York; vii + 310 pp., $5.

ULTRAMICROCHEMICAL techniques are playing an increasingly essential part in biological research and in chemical manipulation of radioisotopes. This book collects and organizes the data, covering all essential techniques for the use of these methods and giving explicit working directions.

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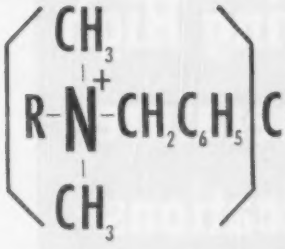

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Onyx is the leading producer of quaternaries. Besides BTC, we make: Lauryl Isoquinolinium Bromide, Dialkyl Dimethyl Ammonium Bromide, Cetyl Dimethyl Benzyl Ammonium Chloride, Alkenyl Dimethyl Ethyl Ammonium Bromide, Alkyl Dimethyl 3:4 Dichlorobenzyl Ammonium Chloride and many others.

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BTC is the quaternary that has been most widely used since these cationic germicides and deodorizing agents were first used commercially.

The bactericidal, bacteriostatic and deodorizing action of BTC in all phases of sanitation has been thoroughly tested and proved through many years of use.

Authoritative studies of BTC by independent biological laboratories have definitely established:

1. Lack of skin irritation and sensitization at all normal use-dilutions.
2. Lack of toxicity at all normal use-dilutions.
   (a) Through acute toxicity tests on guinea pigs, white rats and dogs.
   (b) Through chronic toxicity tests lasting 3½ years on guinea pigs and white rats.

Dilution of the 50% concentrate with water to a 10% solution provides producers of germicides, disinfectants, deodorants and related products with a ready-to-market product. BTC can also be used as a compounding ingredient in many other products.

THIS BULLETIN covers not only the data outlined above, but includes a great deal of additional information on BTC, including sporicidal activity, speed of action, compatibility, methods of evaluation and detailed application instructions.

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	1300	7,000
Stress for Rupture in 1000 hrs.	1100	32,000
	1200	21,000
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Titanium stabilized stainless steel offers many competitive advantages at a substantial saving in cost compared to other types of stabilized stainless. The excellent high temperature properties, shown here, are an example. Alloys of Titanium used in making type 321, are made at Niagara Falls from U.S. ores. This assures the user a plentiful supply of type 321 stainless steel.

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4-p. bulletin describes services and equipment for processors of oils, fats and other organics. The Patterson Foundry and Machine Co.

Pipe Fittings K552
Bulletin 104 describes line of cast iron, malleable and bronze fittings. The Kennedy Valve Mfg. Co.

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8-p. bulletin contains dimensions, capacity tables, shutter and support data and installation information on proportioning oil burners. The Anthony Co.

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16-p. catalog describes construction, applications and gives specifications for electric industrial heating elements and units. Tuttle and Kift, Inc.

Electronic Timer.....K576
4-p. bulletin describes design, operation and applications for electronic timer. Bulletin GEA-5255, General Electric Co.

Eye Protection.....K577
Booklet contains a comparison of chemicals in relation to their severity of eye injuries and suggests types of protection for exposures. American Optical Co.

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16-p. catalog outlines basic principles of freeze-drying and describes design and advantages of freeze-drying equipment for research and industry. Catalog 706, F. J. Stokes Machine Co.

Air Traps.....K603
4-p. bulletin describes selection, installation, operation and applications of air traps for automatic drainage of moisture from compressed air coolers, aftercoolers, receivers, separators and drip points. Armstrong Machine Works.

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12-p. booklet discusses history, behavior and potential uses of Monobed ion exchange systems. Resinous Products Division, Rohm and Haas Co.

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16-p. bulletin describes method of selection and contains horsepower rating tables, capacities and dimensions for concentric shaft speed reducers. The Falk Corp.

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Flange and coupling selector presents pertinent data for 150 and 300 lb. A.S.A. Standard and standard, extra heavy, 3,000 and 6,000 lb. coupling and shows wall thicknesses of standard, extra heavy and double extra heavy pipe. Nooter Corp.

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4-p. bulletin contains case studies of various materials handling problems and their solutions. The Rapids-Standard Co.

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4-p. bulletin discusses basic difference between flowing service and dead end regulation and suggests tests for small volume air pressure regulation. Capacity charts and other technical data included. Conoflow Corp.

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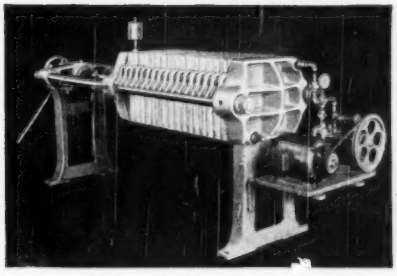

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NEWS OF THE MONTH

New liquid resin plant of the Catalin Corp. of America at Calumet City, Ill. The new facilities, designed and erected by Blaw-Knox Co., will produce liquid phenolic, urea and melamine resins for use in waterproof adhesives and binders.

New Construction

• **A $3 million plant** to produce cracking catalysts for the petroleum industry will soon be built by American Cyanamid Co. in Chicago, Ill. The new plant, expected to be in operation toward the middle of 1951, will increase Cyanamid's present capacity for these products by more than 50%, which means production of more than 3000 tons of these catalysts per month. Site for the new plant was selected because many oil companies have located catalytic cracking plants throughout the Midwest and Atlantic seaboard near large metropolitan areas.

• **Nitrogen solutions** will be produced by Commercial Solvents Corp. in the million-dollar addition to its ammonia plant to be constructed at Sterlington, La. Located on the site of the present Sterlington plant, the unit is expected to be in operation early next year.

• **Contract for engineering and procurement** of Mathieson Hydrocarbon Chemical Corp.'s large new chlorine and caustic soda plant to be located at Saltville Va., has been awarded to Chemical Plants Division of Blaw-Knox Co. Expected to be in operation in 1951, the new unit will be based on the Mathieson mercury cell process.

• **A new furnace carbon black plant** will be built by J. M. Huber Corp., near Baytown, on the Gulf Coast of Texas. Expected to be completed by March 1, 1951, the plant will cost $1.5 million. Annual capacity will be 30 million lbs. HAF type carbon black, raw material for which is oil.

• **The Davison Chemical Corp.,** Cincinnati, Ohio, synthetic fluid catalyst plant is being converted from the ground type production process to the spray drying method. The new stainless steel spray-drying chamber measures 22 ft. in diameter by 14 ft. straight shell and 30 ft. cone, the largest piece of such equipment ever installed for making synthetic fluid type petroleum cracking catalysts. Production is expected to be underway by this October.

• **Construction of a new laboratory** at Midland, Mich., for study of high pressure reaction has been authorized by the executive research committee of The Dow Chemical Co.

• **National Lead Co.** is undertaking an expansion program which will increase production of pigments by 60,000 to 70,000 tons a year. The new facilities are expected to be in operation within a year with full production attained within 18 months.

• **Consolidated Engineering Corp.,** manufacturer of technical instruments, has begun work on its new plant at Pasadena, Calif.

• **Philip E. Calo Co., Inc.,** has completed plans to build a 45 ft. x 200 ft. brick warehouse for indoor storage of packaged and drummed materials at 48th and California, Chicago, Ill. Sufficient tankage will be provided for handling shipment in tank-wagons, drums, etc.

• **Four service buildings**—a chemical storage building, liquid metals storage building, repair garage and a covered vehicle parking shed—will be built at the Knolls Atomic Power Laboratory, Schenectady, N. Y., by the H. K. Ferguson Co. They are scheduled for fall completion.

• **A one-story research building** providing 10,000 sq. ft. of floor space has just been completed at Texas City, Texas, for Pan American Refining Corp. The H. K. Ferguson Co. was the builder.

Washington

• **The Government's revised synthetic rubber program** is being translated into action. U. S. Rubber Co. has begun to reactivate the GR-S synthetic rubber plant at Port Neches, Tex., as requested by the Reconstruction Finance Corp. It is expected that the plant will be in operation in about three months. It has a rated capacity of 60,000 tons, but it will be possible to increase this to 75,000 tons. U. S. Rubber is also operating the Government-owned Copolymer synthetic rubber plant near Borger, Tex., with a capacity of 45,000 tons. The company will continue to operate this plant until Port Neches is fully reactivated, after which operation of the Borger plant will be turned over to the Phillips Chemical Co.

Transfer of operation to Phillips will mean integrated manufacture of synthetic rubber at Borger through all stages from the production of raw materials to the finished product, for Phillips is already operating the adjoining Plains butadiene plant, which it designed and built for the Government during World War II. This plant now produces more than 50,000 tons of butadiene yearly.

• **Descriptions of 16 patents** owned by the U. S. Government and held by the Atomic Energy Commission have been transmitted to the U. S. Patent Office for registry and listing in the Official Register of Patents. The Commission will grant non-exclusive, royalty-free licenses on the listed patents as part of its program to make non-secret technological information available.

• **Modernization and expansion** of the glass plant of Hellenic Chemical Products and Fertilizers Co., Ltd., of Athens, Greece, has been approved by the Economic Cooperation Administration. Overall cost of the project is $3,593,000, of which $1,832,000 represents ECA financing.

• **Three basic industrial projects,** to cost the equivalent of $34,525,000 of which $13,382,000 is ECA financing have been approved for Italy by the Economic Cooperation Administration. These projects cover petroleum cracking units at the Rome and Genoa refineries and a lubricating oil

unit at the Milan refinery for Societa Permolio; construction of an ammonium sulphate plant at Bagnoli for Societa per l'Industria e l'Elettricita (Terni); construction of a plant to produce synthetic ammonia from natural gas in the Po Valley, for Montecatini Co., Milan.

• **An extension of activity** of the Office of Technical Services of the Department of Commerce is expected to make more available to American business firms non-secret atomic energy technical reports. Under the new distribution plan, OTS will become the sales agency and reference source for non-secret A.E.C. technical reports.

Ownership Changes

• **Great Lakes Carbon Corp.** has purchased the coke plant of the Laclede Gas Light Co., St. Louis, Mo. and has taken over its operation.

• **M. W. Kellogg Co.** has sold its stock and assets in one of its subsidiaries, The Kellex Corp., to The Vitro Manufacturing Co. Contracts currently held by Kellex, primarily in the field of atomic energy development, will be continued by that organization.

Robert H. Kampschulte (left), named district manager for the eastern sales area, Chemical Division, Celanese Corp. of America; and Clark C. Heritage, appointed director of development for the Weyerhaeuser Timber Co. Mr. Heritage has directed development work for Weyerhaeuser and for the Wood Conservation Co., Cloquet, Minn., since 1941.

• **Atlas Powder Co. and Darco Corp.,** an unconsolidated subsidiary of Atlas, have agreed to merge, and the merger agreement approved by the board of directors of each company must be approved by holders of two-thirds of the outstanding capital stocks of each company.

Foreign Developments

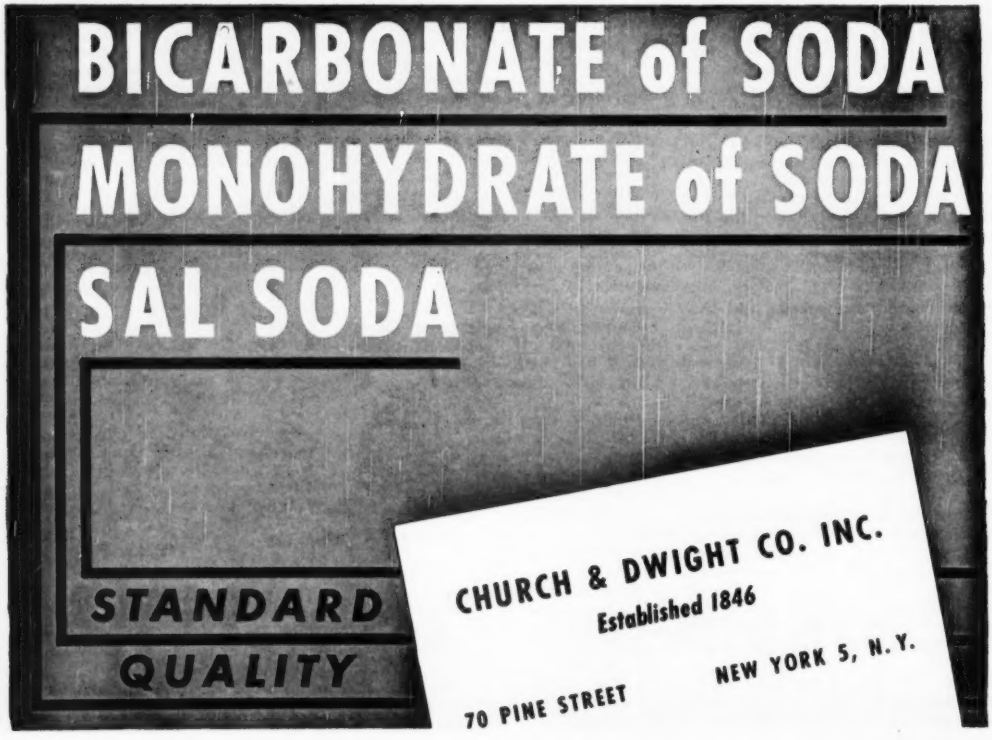
• **Expansion of Canada's chemical industry** now under way or projected for this year is close to the $100 million mark. That was the estimate of Arnold H. Smith, president of Monsanto (Canada) Ltd., speaking before the 33rd annual conference and exhibition of the Chemical Institute of Canada, which met recently in Toronto.

• **New offices of Givaudan Canada, Ltd.** will be opened at 684 Church St., Toronto, under the management of A. F. Breeze. The parent organization, Givaudan-Delawanna, Inc., reports that the increasing demand in Canada for aromatic chemicals and perfumed raw materials has necessitated the step.

New Companies

• **J. H. Pollard,** closely associated for 25 years with major sulphur companies in construction, engineering, exploration and general advisory capacities, has opened his own office in Houston, Texas as a consultant in this field. His services will cover leasing, exploration, evaluation and exploitation of non-metallic minerals, particularly sulphur, and will include design, construction and operating problems.

• **Richard Hulme** has entered the consulting engineering field under



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the name of Richard E. Hulme Associates with offices at 75 Jefferson St., Bradford, Pa. The new company will offer its services in the heavy chemical, petroleum, petrochemical and process industries in both the economic evaluation and process design phases.

General

• **Current shortages** and increasing requirements for benzene and phenol have induced the Bureau of Mines to undertake an investigation of these and other chemicals available in producing synthetic liquid fuels from coal and oil shale. Major objective of the study, in which the National Security Resources Board has expressed interest, is to determine the most desirable processes for producing chemicals in conjunction with synthetic fuels.

An indication of the potential supplies that might be obtained from such operations can be gathered from the fact that a single commercial-scale coal hydrogenation plant producing principally gasoline and liquefied petroleum gases could have produced nearly 20% of our 1948 benzene production and 11% of 1948 phenol production (1949 was not representative because coal strikes curtailed production).

• **Armour Research Foundation,** Registry of Rare Chemicals, 35 West 33 St., Chicago 16, Ill., has added the following to its list of wanted chemicals:

Phosphoryl fluoride.
Ferric bromide, anhydrous.
Ferrous bromide, anhydrous.
Zinc carbonyl.
Ammonium cyanide.
p-Aminoethylbenzene.
ɣ-Aminobutyric acid.
2-Phenylcyclohexanone.
3-Methylpentanol-3.
Acetyl cyanide.
5-Methylisoquinoline.
Acetyl phosphate.
Perfluoroadipic acid.
n-Decyl mercaptan.
n-Hexadecyl mercaptan.
Methyl vinylsulfonate.
Methyl isopropenylsulfonate.
Perillic acid.
Scymnol.
Coniferyl alcohol.

• **Results of a survey** conducted by Monsanto Chemical Co.'s Plastics Div. to determine the retail trade's preference between the words "styrene" and "polystrene" indicate that it is "styrene" ten to one. From a mailing of 5000, 1163 responses showed that 1061 preferred "styrene" and 102, "polystrene."

Company Notes

• **The Du Pont Company** has announced that it is evaluating its new synthetic textile fiber, known ten-

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With this new custom service, manufacturers can now depend on Eastman for many organics not generally available, just as do the research and analytical chemists for whom we stock more than 3,200 compounds indexed in the new *Eastman Organic Chemicals, List No. 37.* If you will drop us a line, we'll be glad to keep you informed about this service.

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tatively as Fiber V on an experimental scale (*CI, "'V' Ups P-xylene Needs," May '50, p. 666*). Limited quantities of window curtains, blouses, sport shirts, sewing thread and summer suitings are the consumer products under test. Industrial products being evaluated include fire hose and V-belts.

• **Merchants Chemical Co., Inc.,** New York, N. Y., has opened a new warehouse in Appleton, Wis.

• **The Illium Corp.** is the new name adopted by Burgess-Parr Co., Freeport, Ill. The new name was chosen because of the close association of the company with its principal product, Illium, a corrosion-resistant alloy.

• **Four hundred sixty-two more** of its patents have been listed by the Du Pont Co. on the U. S. Patent Office Register as available for licensing. This marks no particular change in company policy, since Du Pont has licensed many of its patents through the years and now has about 5400 patents registered in this category.

• **Hanson - Van Winkle - Munning Co.,** Matawan, N. J., has completed arrangements for its Anderson, Indiana, plant to fabricate rolled copper anodes. This service was instituted to take care of electroplating plants in the West.

• **Plant fire prevention pays off.** Hilton-Davis Chemical Co. division of Sterling Drug Inc., Cincinnati, has had no fires involving losses exceeding $50 for the first six months of this year, a new plant record for the company. The company attributes this to good housekeeping, constant vigilance and a large number of employees trained in fire prevention.

• **National Technical Laboratories,** manufacturer of Beckman scientific and industrial instruments, has changed its corporate name to Beckman Instruments, Inc., to associate the company more closely with the trademark of its principal product.

• **George H. Lincks, Inc.,** has moved its office to 312 Bridge St., Brooklyn 1, N. Y.

• **The Hammond Iron Works** has opened a new fabricating plant at Bristol, Pa.

• **Brown Instruments Div. of Minneapolis-Honeywell Regulator Co.** begins the second half of its 1950 maintenance and repair courses on August 14.

Paul E. Burchfield (left), who recently succeeded C. S. Johnson (right) as director of technical service, Wyandotte Chemicals Corp., Michigan Alkali Division. Mr. Johnson, who is retiring, will serve Wyandotte Chemicals in an advisory capacity. Dr. Burchfield has been assistant technical service director since 1946.

CALENDAR *of* EVENTS

AMERICAN ASSOCIATION OF TEXTILE CHEMIST AND COLORISTS, The Wentworth, Portsmouth, N. H., Sept. 28-30.
AMERICAN CHEMICAL SOCIETY, 118th national meeting, Chicago, Sept. 3-8.
AMERICAN COKE AND CHEMICALS INSTITUTE, Skytop Lodge, Skytop, Pa., Sept. 27-29.
AMERICAN GAS ASSOCIATION, annual convention, Atlantic City, N. J., Oct. 2-6.
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, regional meeting, Minneapolis, Minn., Sept. 10-13.
AMERICAN OIL CHEMISTS SOCIETY, fall meeting, Sir Francis Drake Hotel, San Francisco, Sept. 26-28.
ASSOCIATION OF CONSULTING CHEMISTS AND CHEMICAL ENGINEERS, INC., annual meeting, Shelburne Hotel, New York City, Oct. 24.
DRUG CHEMICAL AND ALLIED TRADES SECTION, NEW YORK BOARD OF TRADE, annual meeting, Shawnee Inn, Shawnee-on-Delaware, Pa., Sept. 21-23.
ELECTROCHEMICAL SOCIETY, INC., Hotel Statler, Buffalo, N. Y., Oct. 11-14.
INDUSTRIAL PACKAGING AND MATERIALS HANDLING EXPOSITION, Philadelphia, Pa., Sept. 26-29.
INSTRUMENT SOCIETY OF AMERICA, instrument conference and exhibit, Memorial Auditorium, Buffalo, N. Y., Sept. 18-22.
NATIONAL CHEMICAL EXPOSITION, Chicago Coliseum, Chicago, Sept. 5-9.
NATIONAL PEST CONTROL ASSOCIATION, annual meeting, Netherland Plaza Hotel, Cincinnati, Ohio, Oct. 23-25.
NATIONAL PETROLEUM ASSOCIATION, Hotel Traymore, Atlantic City, N. J., Sept. 13-15.
SOCIETY OF THE PLASTICS INDUSTRY, annual national conference, New Ocean House, Swampscott, Mass., Oct. 18-20.
TANNERS COUNCIL OF AMERICA, INC., annual meeting, Edgewater Beach Hotel, Chicago, Oct. 26-27.

• **Chemical companies** report the following sales and earnings on past operations:

Company	Sales for Six Months Ending June		Net Income for Six Months Ending June	
	1949	1950	1949	1950
Monsanto Chemical Co.	——	$102,704,934	$7,989,858	$13,123,061
Mathieson Chemical Corp.	——	38,152,707	3,365,819*	4,410,084

* Does not include first quarter earnings of Standard Wholesale Phosphate and Acid Works, Inc. and Southern Acid and Sulphur Co., Inc., acquired Apr. 1, 1949.

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An interesting additional advantage worthy of investigation is this: some products made with spent acid have better physical properties than those made with high-purity acid.

We handle hundreds of tons of spent acids every day. These acids vary widely from high quality to low acidity, and are priced in proportion.

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PERSONNEL

Henry Thouron (left), appointed director of sales for Hercules Powder Co.'s Synthetics Dept.; and John Andrews, named general manager of Godfrey L. Cabot's newly created Plasticizers Division. Mr. Thouron has been on special assignment at The Hague, Holland, for the past year.

Company Officers

• H. F. Croft has been named acting general manager of **S. C. Johnson & Son, Inc.**, assuming the responsibilities and duties of J. J. Babb, who has left the company to become president of Lever Brothers Co. R. W. Carlson was elected sales vice-president and J. V. Steinle, research and development vice-president.

• H. E. Bakken has been elected vice-president and general manager of the **Aluminum Ore Co.**, subsidiary of the Aluminum Co. of America, and Kent Van Horn has been named associate director of research for **Aluminum Research Laboratories.** Mr. Bakken has been with Alcoa since 1919.

• The board of directors of **Sterling Drug Inc.** has elected J. Mark Hiebert, M.D., to the newly created post of executive vice-president. He has been a vice-president since 1945, assistant to the president in the management of the business since 1947 and a member of the board since May 31, 1949.

• W. J. O'Brien, vice-president of **The Glidden Co.**, has retired. He will remain on the Glidden Company's staff as a technical consultant and director.

• C. Douglas Porch, president of **Kinetic Chemicals, Inc.**, long a Du Pont Co. affiliate, has retired. He has been with Du Pont and Kinetic Chemicals for more than 43 years.

Production

• Russell Sloman has succeeded Thomas Hoshall as manager of **The Davison Chemical Corp.** fertilizer plant at Perry, Iowa. Mr. Hoshall has resigned to accept a similar position in Omaha.

• Joseph W. Lang has been ap-

(*Turn to page 354*)

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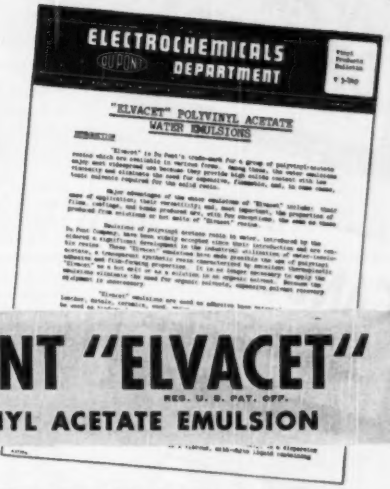

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CHEMICAL MARKETS

Chemicals Maintain High Production Levels

Domestic production levels of industrially important inorganic chemicals were generally higher than those reported for May 1949 or April 1950, according to the Bureau of the Census. Of the 37 chemicals included in this survey, 30 were produced in larger volume and 3 in smaller volume than for the corresponding period of last year. In comparison with last month's figures increases were reported for 25 chemicals while production declines occurred for 12.

May production was the highest on record for hydrochloric, phosphoric, and sulfuric acids, chlorine, activated carbon, chrome yellow and orange, and calcium phosphate (dibasic). Production of sodium hydroxide by the electrolytic process also reached an all-time high, although the total, by all processes, was about 1 percent less than the monthly production record of 221,605 tons produced in December 1948.

Inks Show Marked Change In Export Pattern

Exports of printing and lithographic inks in 1949 present a striking contrast to prewar shipments, according to a recent analysis by the Chemical Branch of the U. S. Department of Commerce. The 13 million pounds sold abroad almost doubled 1938 sales and were 62 per cent higher than in 1939, although slightly lower than the 1948 peak. A 427-per cent increase in value was recorded over the same period as a result of a rise in prices from approximately 14 cents to 40 cents per pound. Of the whole group of paints and pigments exported in 1949, printing and lithographic inks made up 7 per cent.

Markets for these products have shifted considerably. Before the war, Argentina was the leading destination, but along with the sharp decline in its purchases of all U. S. chemicals, imports of ink dropped more than 98 per cent in 1949 from those in 1938 when over a million pounds were shipped.

Cuba has been a good customer all along and the 1.8 million pounds it took represented 15 per cent of total exports. Sales to the United Kingdom, one of the best prewar markets (more than half a million pounds in 1938), dropped off almost 100 per cent in recent years.

Shipments of 2.2 million pounds to China in 1948 was 1,200 per cent above those in 1939, and even with a slight decline in 1949 to 1.9 million pounds, shipments were more than 1,000 per cent greater. Hong Kong also took large and increasing quantities (1.7 million pounds in 1949); the two customers together purchased 28 per cent of total shipments in 1949.

Mexico was an important prewar market and held fourth place in 1948 with over 800,000 pounds. However, 1949 showed a big reduction, which was probably due to increased import duties.

Natural Rubber Production Set at 1.6 Million Tons

At the seventh meeting of the Rubber Study Group, held in Brussels, Belgium, in May, the estimated natural rubber production for the world was put at 1,605,000 long tons. This was broken down as follows:

Estimated Natural Rubber Production in 1950

	Long tons
Malaya	685,000
Indonesia	520,000
Ceylon	95,000
Indochina	45,000
Thailand	92,000
British Borneo	64,000
Burma	10,000
Liberia	30,000
Other countries	64,000
Total	1,605,000

Estimated Natural and Synthetic Rubber Consumption in 1950
(in 1,000 long tons)

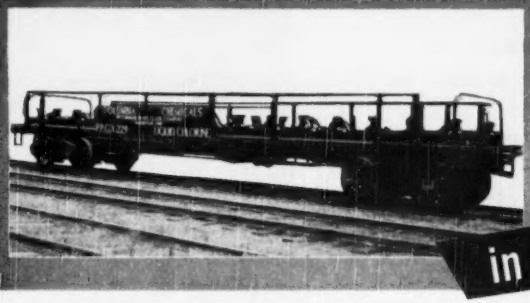
	Natural	*Synthetic (a)*	*Total*
USA	600	425	1,025
UK	195	3	198
Belgium	11	(b)	11
Denmark	5	(b)	5
France	92	8	100
Italy	37	3	40
Netherlands	13	(b)	13
Australia	26	(b)	26
Canada	37	17	54
Other countries	449	4	453
Total	1,465	460	1,925

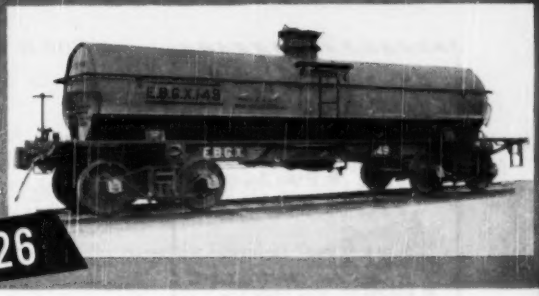
(a) Excludes Russian production.
(b) Small quantities.
Note: No allowances for additions to government or commercial stocks.

Film Production Tops in Vinyl Breakdown

Of the 156 million pounds production of vinyl plastics reported by the government for 1949, Bakelite Division, Union Carbide and Carbon Corp. estimates that approximately 16 million pounds comprise safety glass sheeting and approximately 60 million pounds represent heavy gauge sheeting, mostly .012" and .020" thickness. The estimate for vinyl film produced is 80 million pounds, the great bulk being calendered film. This estimate was given by Bakelite vice-president Howard S. Bunn at the first Plastic Film and Sheeting Conference, held in New York City recently under the sponsor-

In 1926 chlorine was shipped either in small container cars or 15-ton tank cars.





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chlorine tank car capacity was 15 tons...

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15 TONS

30 TONS

55 TONS

Now you can ship chlorine more economically in the right size tank car for your needs. GATX helps widen your market for your other commodities, too, by providing safe, low cost transportation of bulk liquid chemicals in more than 200 types of specialized tank cars.

Bulk shipping keeps pace with chemical progress

Consult your nearest GATX office for information about the safe, economical shipping of all your bulk liquid chemicals.

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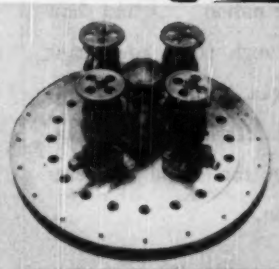

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Canada Sets Record For Chemicals

Canada's chemical and allied industries set a new peacetime production record in 1949. The year's production value climbed to $594,800,000 or 2.6% over its previous peacetime peak of $579,800,000 in 1948, according to the Bureau of Statistics, Ottawa, Ont.

The new high was exceeded only in two war years—in 1943 and 1944—when shell-filling orders boosted production values to $653,500,000 and $730,900,000 respectively.

Ten of the 14 industries in the chemicals group showed substantial output gains in 1949. Of these coal tar distillation rose 17.7% to $9,504,000; polishes and dressings, 15.1% to $11,606,000; primary plastics, 14.4% to $18,805,000; medicinals, 11.1% to $79,685,000.

Imports of chemicals and allied products increased 10% in 1949 to $130,600,000. Gains were mainly in drugs and pharmaceuticals, cellulose plastics, fertilizers and miscellaneous chemicals.

Purchases from the United States were worth $115,000,000 or 88% of the total imports. Purchases from the United Kingdom amounted to $8,400,000; France, $1,800,000; Switzerland, $1,100,000 and Germany $1,000,000.

Between 1940 and 1949 the output value of Canada's chemical and allied industries increased threefold—from $194,000,000 to $595,000,000. About half of this gain, however, was due to increases in commodity prices.

Over the same period the bureau's index of production volume advanced from 120.1 to 182.2.

Market Review

Continuation of the upward trend in chemical prices and an aggravation of the alkali situation because of labor disturbances characterized last month's activities. Added to that was the consideration of how the Korean conflict would affect the chemical industry. Some of the temporary shortages and price rises were attributed to effects of mobilizing the economy for war.

With about forty percent of alkali production out because of a strike tying up three plants, both soda ash and caustic soda joined chlorine in the tight category. Potassium carbonate and caustic potash also showed signs of becoming increasingly scarce. Among price advances were increases of $10 and $7.50 in barium chloride and barium carbonate, establishing prices per ton of $100 and $80, respectively. Tin oxide was increased from 84¢ to 86¢ a pound.

Benzol maintained its position as the number one short organic chemical, especially with the government stepping up the synthetic rubber program and its attendendent requirements for styrene, which is made from benzol. Some easing of the situation was expected from about 20 million gallons reportedly soon to be available from England. Synthetic phenol, also made from benzol, was boosted 2¢ a pound by a major producer, establishing a tankcar price of 15½¢ a pound. Toluol and xylol were both scarce, and although there was no advance in the coaltar materials, those from petroleum were upped 2¢ a gallon to establish a price of 28¢ a gallon at Baytown, Tex., and 30¢ at Albany, Bayonne, Chicago, Detroit, Philadelphia, and Providence.

In the first price increase since March 1949, all grades of refined glycerin were boosted 5¢ a pound. New tankcar prices are 29½¢ for C. P.; 28½¢ for dynamite; and 28-¾¢ for high gravity. Since the Korea trouble, there has been an increase in demand which probably will grow further. There have been no offerings of domestic crude.

With no easing of the shortage of DDT and benzene hexachloride, the pesticide market continued tight. Calcium arsenate was advanced 1½¢ a pound to 11¢, and demand for it was on the upswing. Among fertilizers, pulverized cyanamide was reduced from $2.55 to $2.25 per N unit, f.o.b., works.

Paint pigments, which had followed pig lead down the price scale, followed it up again as the metal scored two advances. The latest advance boosted the oxides ½¢ a pound, and dry white lead ½¢-¾¢ a pound. New prices established were: dry red lead, 14¾¢; litharge, 13¾¢; orange mineral, 17.1¢; dry white lead, basic carbonate, 14¾¢ and basic silicate, 13¾¢. Iron oxides rose ¼-½¢ a pound to set these truckload prices: yellow, 9½¢; red 11¾¢; and black 11¢.

Naval stores showed much strength in the Savannah market with gum rosin scoring a series of gains. Gum turpentine also shared in the increase in demand, rising sharply to 41¾¢ a gallon in Savannah, 1¾¢ above the prevailing price at the beginning of the new naval stores year.

Following a period of uncertainty, demand for materials expected to be in jeopardy because of conditions in the Far East picked up. Generally poor stocks of botanicals and fear for replacement lead to the feeling that prices would work up. Tanning materials experienced a demand not seen since the war.

Among other price changes were a 2¢ reduction in 2-ethylbutanol, establishing the tankcar price at 26¢ a pound; a 1¢ a pound reduction in the price of some of the Spans and Tweens, Atlas Powder Co.'s surface-active agents; a 13-15% cut in Antara Products' nonionic surfactants; a reduction in technical chloral to 21¢ a pound in tankcar; a new schedule for tetrahydrofurfuryl alcohol setting the tank car price at 38¢ a pound, f.o.b. Niagara Falls; and sharp reductions in vitamin B-12 and synthetic vitamin A.

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Abstracts of United States Patents

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Printed copies of U. S. patents are available from the Patent Office at 25 cents each. Address the Commissioner of Patents, Washington, D. C., for copies and for general information concerning patents or trade-marks.

U. S. Patents from Official Gazette—Vol. 632, No. 4 (March 28) and Vol. 633, Nos. 1, 2, 3 (April 4-18)

Organic

Manufacture of alpha-alpha-disubstituted-beta-amino-propionic acids selected from the group consisting of beta-amino-alpha-phenyl hydrotropic acid and amino-pivalic acid, by hydrogenating a compound selected from the group which consists of alkali metal salts and alkaline earth metal salts of beta-nitro-alpha-phenyl hydrotropic acid and nitro-pivalic acid in an aqueous medium containing Raney nickel. 2,501,825. Celanese Corp. of America.

In production of 2,6-dichlor-4-nitro-aniline by the chlorination of p-nitro-aniline-ortho-sulfonic acid, the steps which comprise chlorinating p-nitro-aniline-ortho-sulfonic acid to form 4-nitro-6-chlor-aniline-2-sulfonic acid, raising the temperature and then further chlorinating whereby the sulfonic acid group is replaced and 2,6-dichlor-4-nitro-aniline is formed. 2,501,831. Celanese Corp. of America.

Isomerizing fatty oils by continuously pumping a stream of oil through a mass of nickel on unground activated carbon catalyst. 2,501,851. Maytag Co.

Production of the 4'-(β-ethyl)-morpholine ester of pyridine-3-carboxylic acid by reacting a compound selected from the group consisting of nicotinic acid esters and salts of nicotinic acid, with a compound selected from the group consisting of 4-(β-hydroxyethyl)-morpholine and 4-(β-halogenethyl)-morpholine. 2,501,858. Cilag Ltd.

Manufacturing pentaerythritol, in which boric acid, formaldehyde, acetaldehyde, and calcium hydroxide are reacted in an aqueous reaction medium. 2,501,865. Walter M. Fuchs.

Condensation product of 6-sulfanilamido-3-methyl-pyridazine with formaldehyde. 2,501,892. Ciba Pharmaceutical Products, Inc.

Dichlorovinyl ethers. 2,501,896. Ciba Ltd.

Production of 1:3:5-triamino-benzene monohydrate by contacting 1:3:5 trinitro benzene in an ethyl acetate solvent with hydrogen in the presence of a "Raney" nickel catalyst. 2,501,907. Imperial Chemical Industries Ltd.

Production of halogenated organic peroxides by the direct halo-substitution of the corresponding organic peroxides, in the presence of a catalyst. 2,501,966. Shell Development Co.

Halogenated di-tertiary-alkyl peroxides. 2,501,967. Shell Development Co.

Alkylating an aromatic hydrocarbon, by contacting said aromatic hydrocarbon by contacting said aromatic hydrocarbon with a tertiary aliphatic monosulfide, in the presence of an alkylation catalyst of the silica-alumina type. 2,502,000. Socony-Vacuum Oil Co., Inc.

Alkylating an aromatic hydrocarbon, by contacting said aromatic hydrocarbon with a tertiary aliphatic mercaptan, in the presence of an alkylation catalyst consisting essentially of a silica and alumina composite. 2,502,001. Socony-Vacuum Oil Co., Inc.

In preparing mononitrofuran compounds subjecting a furan compound having a replaceable hydrogen atom in at least one of the alpha positions on the furan ring, dissolved in an acetic anhydride medium, to the action of a nitrating agent in the presence of a phosphorus compound selected from the group consisting of phosphorus chlorides, phosphorus bromides, phosphorus oxides, phosphorus oxychloride and phosphorus oxybromide. 2,502,114. Allied Chemical & Dye Corp.

Making monobromopyridine by passing vapors of dibromopyridine in admixture with hydrogen over nickel. 2,502,125. Dow Chemical Co.

Di(heterocyclicacylamino)diphenyldisulfide. 2,502,150. American Cyanamid.

Alkylating pyridine by heating with an aliphatic organic acid of the class consisting of acetic acid and propionic acid, the tetravalent lead salt of said aliphatic organic acid, and a catalyst of the class consisting of methanol and ethanol. 2,502,174. Reilly Tar & Chemical Corp.

Preparing phenyl mercuric acetate and nitrate wherein a mercurating agent selected from the group consisting of mercuric acetate and mercuric nitrate is reacted with benzene, in the presence of at least one fluoride selected from the group consisting of hydrogen fluoride, boron trifluoride and antimony trifluoride. 2,502,222. Edwal Labs., Inc.

Derivatives of diethylstilbestrol. 2,502,324. Armour and Co.

Derivatives of hexestrol. 2,502,325. Armour and Co.

Delta-(5-carboxy-2-thienyl)-valeric acid and esters. 2,502,344. E. I. du Pont de Nemours & Co.

New tetrachlorethyl ethers of phenols. 2,502,355. Ciba Ltd.

In producing ortho-chloro-mercuriphenol, wherein mercuric acetate is reacted with phenol, the step which comprises carrying out the mercuration reaction in the presence of at least one fluoride selected from the group consisting of hydrogen fluoride, boron trifluoride and antimony trifluoride. 2,502,382. Edwal Labs., Inc.

Polyalkylthiophene having at least 3 alkyl groups of which at least one is an alkyl group having 15 to 24 carbon atoms and at least one alkyl group has 3 to 5 carbon atoms. 2,502,390. Socony-Vacuum Oil Co., Inc.

Preparation of tetra-alkyl esters of a diphosphoric acid by heating a mixture consisting of a trialkyl phosphate and elemental chlorine. 2,502,400. California Spray-Chemical Corp.

Preparation of a tetra-alkyl ester of diphosphoric acid by heating a trialkyl phosphate, chlorine and at least one member selected from the group consisting of elemental phosphorus, phosphorus trichloride and phosphorus pentachloride. 2,502,401. California Spray-Chemical Corp.

Preparation of vinylidene cyanide by pyrolysis of novel 4,4-disubstituted cyclohexenes. 2,502,412. B. F. Goodrich Co.

4-carboethoxy-3-keto-2-γ-phenoxy-propyltetrahydrothiophene. 2,502,421. Parke, Davis & Co.

2'-keto-3,4-imidazolido-2-ω-substituted alkyl thiophenes. 2,502,422. Parke, Davis & Co.

4-carbalkoxy-3-keto-2-substituted tetrahydrothiophene oximes. 2,502,423. Parke, Davis & Co.

3-acylamino-4-carboalkoxy-2-ω-R-alkylthiophenes. 2,502,424. Parke, Davis & Co.

3-acylamino-2-ω-R-alkyl-4-thiophene-carboxylic acid hydrazides. 2,502,425. Parke, Davis & Co.

3-acylamino-2-ω-R-alkyl-4-thiophene-carboxylic acid azides. 2,502,426. Parke, Davis & Co.

3-acyl amino-4-carboalkoxyamino thiophenes. 2,502,427. Parke, Davis & Co.

Producing conjugated diene hydrocarbons by heating a compound selected from the group consisting of ethylenically unsaturated vinyl ethers and α chloralkyl ethers. 2,502,430. General Aniline & Film Corp.

Producing conjugated diene hydrocarbons by contacting a mixture of a compound selected from the class of ethylenically unsaturated ethers and α-chloralkyl ethers. 2,502,431. General Aniline & Film Corp.

Producing conjugated diene hydrocarbons by contacting an ethylenically unsaturated ether with a dehydration catalyst. 2,502,432. General Aniline & Film Corp.

Acetals of oxy and polyoxy α,ω-aldehydes by reacting a vinyl ether with an acetal of a 1,3-dicarbonyl compound in the presence of an acid reacting condensing agent. 2,502,433. General Aniline & Film Corp.

4-amino-3-pentadecyl phenol. 2,502,436. Harvel Corp.

Tri-nitro 3-pentadecyl phenols. 2,502,437. Harvel Corp.

Amino-alkyl esters of diphenylamine 2-monocarboxylic acids. 2,502,451. Ward, Blenkinsop & Co. Ltd.

Reacting diphenylamine with beta-propiolactone and recovering primarily beta-(N,N-diphenyl)-amino propionic acid. 2,502,453. B. F. Goodrich Co.

Preparing calcium D-arabonate by subjecting an aqueous solution of calcium 2-keto-D-gluconate to electrolytic oxidation under slightly acid conditions in the presence of calcium bromide. 2,502,472. U.S.A. as represented by the Secretary of Agriculture.

Tetrafluorosuccinic acid derivatives. 2,502,478. American Cyanamid Co.

Dithiocyanogen adduct of an ester of 4-hydroxybutadiene-1,2. 2,502,507. E. I. du Pont de Nemours & Co.

Synthetic drying compositions capable of forming drying films, said drying compositions being linear polymeric esters of dimeric unsaturated drying oil acids with dihydric phenols having the two phenolic hydroxyls attached to separate aromatic nuclei. 2,502,518. Devoe & Raynolds Co., Inc.

Halogenated hydroxybenzamides of the thiazole series. 2,502,528. Sandoz Ltd.

Manufacturing alkylcyclopentane hydrocarbons by destructive hydrogenating a bicycloalkane hydrocarbon. 2,502,569. Universal Oil Products Co.

Reaction of hydrogen sulfide with olefins for mercaptan synthesis. 2,502,596. Phillips Petroleum Co.

Purifying a crude alkanesulfonic acid containing nitrogen oxides and sulfoxides. 2,502,618. Standard Oil Co. (Indiana).

In removing extraneous colloidal and coloring matter from a salt of an organic sulfonic acid produced by the oxidation of a sulfur compound selected from the group consisting of hydrocarbon thiols and sulfur compounds the step of subjecting said salt to an elevated temperature to effect substantial conversion of said colloidal and coloring matter to adsorbable products. 2,502,619. Standard Oil Co. (Indiana).

In making purified neutral dodecyl pyridinium chloride from dodecyl chloride and pyridine, the steps comprising treating a crude acidic dodecyl pyridinium chloride solution with activated carbon, adding trisodium phosphate, sparging with steam, filtering, agitating the filtrate with activated carbon, adding trisodium phosphate, sparging with steam, and filtering. 2,502,643. E. I. du Pont de Nemours & Co.

Preparing acrylonitrile by vapor phase catalytic reaction of acetylene and hydrogen cyanide. 2,502,678. B. F. Goodrich Co.

Nitrating hydrogenated cardanol by adding an aqueous solution of nitric acid to a solution of hydrogenated cardanol. 2,502,708. Harvel Corp.

Producing magnesium phthalocyanine by fusing a compound chosen from the group consisting of phthalic anhydride phthalimide and phthalamide in admixture with at least one compound chosen from the group consisting of magnesium amide, magnesium imide and magnesium nitride. 2,502,748. Kaiser Aluminum & Chemical Corp.

Preparing the sulfur trioxide addition compound of a 4-alkyl-morpholine by extracting an aqueous mixture containing water-soluble salts and the 4-alkyl-morpholine with an inert, liquid, water-immiscible organic solvent to dissolve the 4-alkyl-morpholine. 2,502,839. American Cyanamid Co.

Nicotinyl salicylic acid. 2,502,868. National Drug Co.

N-4-[{[(2-amino-4-hydroxy-7-methyl-6-pteridyl)-methyl]amino}benzoyl] glutamic acid. 2,502,869. National Drug Co.

Nicotinyl gentisic acid. 2,502,870. National Drug Co.

An omega-sulfomethyl dicyandiamide, NC-HN-C(=NH)-NH-CH_2SO_3M in which M is an inorganic cation. 2,502,897. American Cyanamid Co.

Composition stabilized against discoloration consisting of an ether of the group consisting of sulfolanyl ethers, substituted sulfolanyl ethers and mixtures thereof, which becomes discolored when exposed to air and heat and a stabilizing amount of at least one phenolic compound. 2,502,934. Shell Development Co.

Alkyl substituted amido pyrophosphates. 2,502,966. Monsanto Chemical Co.

Recovery of secondary alcohols from acid extracts. 2,502,978. Standard Oil Development Co.

Producing aldehydes from olefin alpha oxides by heating said oxides in contact with a chromic oxide gel catalyst composition which contains, in addition a pair of compounds selected from the group of pairs consisting of cadmium oxide-tungsten oxide and tungsten oxide-iron oxide. 2,503,050. Wyandotte Chemicals Corp.

2-(N:N-diphenyl-aminomethyl)-imidazolines. 2,503,059. Ciba Pharmaceutical Products, Inc.

Perhalogenated ethylcyclopentane. 2,503,077. U.S.A. as represented by the U. S. Atomic Energy Commission.

Making a monohydro-perhalo-ethylcyclopentane by reacting 2,4-dihydro-3-trichlorethenyl-perchloropentane with hydrogen fluoride in the presence of a halide of pentavalent antimony. 2,503,078. U.S.A. as represented by the U. S. Atomic Energy Commission.

Bis-phenols. 2,503,196. Dow Chemical Co.

Dibromides of 2-vinylthiophenes. 2,503,197. Monsanto Chemical Co.

5-(2'-thienyl)-2-iminodihydro-1,3-oxathioles. 2,503,198. Monsanto Chemical Co.

Separating gamma valerolactone from aqueous solutions by extraction with benzene, toluene and the xylenes. 2,503,200. Monsanto Chemical Co.

Treating a neutral polyphosphoric acid ester comprising trivalent phosphorus containing esters with ethyl phosphoryl dichloride, chlorine, whereby said trivalent phosphorus is oxidized to pentavalent phosphorus and thereafter treating said chlorinated product with an anhydrous alcohol. 2,503,204. Monsanto Chemical Co.

3,6-epoxy-1,2,3,6-tetrahydrophthalonitriles. 2,503,206. Monsanto Chemical Co.

Chloro-aryloxy alkanes. 2,503,207. Dow Chemical Co.

Recovering dehydroabietic acid from resin acid material in which abietic acid has been largely converted to dehydroabietic acid, by preparing an aqueous dispersion of said resin acid, and crystallizing dehydroabietic acid. 2,503,238. Continental Research Corp.

Azo catalysts in preparation of sulfonyl chlorides by the reaction of a saturated hydrocarbon with a mixture of sulfur dioxide and chlorine. 2,503,253. E. I. du Pont de Nemours & Co.

Preparation of 1-amino-4-bromoanthraquinone-2-sulfonic acid by brominating 1-aminoanthraquinone-2-sulfonic acid. 2,503,254. General Aniline & Film Corp.

Separating constituents of coke oven gases by compression and distillation. 2,503,265. Koppers Co., Inc.

Stabilizing abietic acid by heating in the presence of a substance selected from the group consisting of the elements sulphur, selenium and tellurium and their reducible di-oxides and halides. 2,503,268. G and A Labs., Inc.

Azo catalysts in preparation of sulfonyl chlorides by the reaction of sulfuryl chloride with a saturated hydrocarbon. 2,503,279. E. I. du Pont de Nemours & Co.

Azo catalysts in preparation of sulfonic acids from sulfur dioxide, oxygen, and a hydrocarbon. 2,503,280. E. I. du Pont de Nemours & Co.

α,β-diphenylethylamine containing in the β-phenyl nucleus hydroxyl and lower alkoxyl substituents and salts thereof. 2,503,285. Winthrop-Stearns Inc.

Preparation of fluoranthene and ring substituted fluoranthene by passing a compound selected from the class consisting of phenyl naphthalene, a partially hydrogenated derivative of phenyl naphthalene and a ring substituted phenyl naphthalene in contact with a dehydrogenating catalyst. 2,503,292. U.S.A. as represented by the Secretary of the Interior.

Iodinated hydroxyaryl-aryloxy-aliphatic acids and their thio analogs. 2,503,296. Schering Corp.

Lignin aliphatic acids and salts. 2,503,297. Albemarle Paper Mfg. Co.

Production of monochloracetic acid by passing chlorine into a hot liquid mixture of acetic acid and a minor proportion of acetic anhydride to form monochloracetic acid and acetyl chloride. 2,503,334. Celanese Corp. of America.

Improving the purity of an ester of a 7-dehydrosterol by admixing an ester of a 7-dehydrosterol with a saturated aliphatic hydrocarbon solvent. 2,503,385. Nopco Chemical Co.

Oleaginous material containing a 1,3,4-tricarboxy-2-thiabutane. 2,503,401. Standard Oil Co.

Production of phenols by dehydrogenating in the presence of a catalyst comprising a platinum group metal and an alkali metal compound, an organic compound having at least one ring containing 6 carbon atoms, one of the said carbon atoms having attached thereto a substituent selected from the group consisting of a keto oxygen atom, a hydroxyl group, at least two of the said carbon atoms being saturated with respect to hydrogen. 2,503,641. Imperial Chemical Industries Ltd.

In oxidation of tertiary butyl mercaptan to ditert.-butyldisulfide in the presence of a hydrous cupric halide, the improvement which comprises effecting said oxidation when said cupric halide is dissolved in a monoalkyl glycol ether with water. 2,503,644. Phillips Petroleum Co.

N-phenethyl-beta-alanine derivatives. 2,503,652. Burroughs Wellcome & Co. (U.S.A.) Inc.

Preparing 1-cyano-1,3-butadiene by dehydrating 1-cyano-2-hydroxy-3-butene by heating in the presence of a catalyst which is a member of the class consisting of the oxides, hydroxides, carbonates, cyanides, alcoholates, phenates, and phosphates of sodium and potassium, and the hydroxides of calcium and barium. 2,503,710. Rohm & Haas Co.

In a two-step method of preparing N,N'-diphenyl p-phenylene diamine which comprises condensing hydroquinone and aniline in the presence of a condensation catalyst, the improvement which comprises increasing the product yield by conducting the first condensation in the presence of hydroquinone, and the second in the presence of a trialkyl phosphate. 2,503,712. Eastman Kodak Co.

1,4-di(meta-pentadecyl-phenoxy)-butane. 2,503,731. Harvel Corp.

Heat-convertible liquid for coating compositions comprising a polyhydric alcohol esterified with tall oil and dicarboxylic acid monoester of a beta-unsaturated monohydric alcohol. 2,503,772. ½ to Montclair Research Corp. and ½ to Ellis-Foster Co.

In preparing N,N'-diphenyl p-phenylene-diamine which comprises condensing hydroquinone with aniline, the improvement which comprises carrying out the reaction in the presence of an organic phosphate catalyst. 2,503,778. Eastman Kodak Co.

Producing an organic iron-alkali metal complex comprising introducing into an aqueous solution of a ferrous malate an alkali metal alkali and drying. 2,503,781. Reed & Carnrick.

Manufacture of a diamino-diphenyl-urea by condensing a diaminobenzene selected from the group consisting of 1:3 and 1:4-diaminobenzenes, with urea. 2,503,797. Ciba Ltd.

N'-isopropoxybenzoyl sulfanilamide. 2,503,820. J. R. Geigy A. G.

In manufacture of a cyclopentanopolyhydrophenanthrene containing a keto-group in 11-position, starting from a cyclopentanopolyhydrophenanthrene containing a double bond between the carbon atoms 11 and 12, the steps comprising acting on an unsaturated $\Delta^{11,12}$-cyclopentanopolyhydrophenanthrene with a hypohalogenous acid, resulting in the formation of a 12-halogeno-11-hydroxy-cyclopentanopolyhydrophenanthrene, and treating the product with a dehydrohalogenating agent whereby hydrohalogenic acid is split off and an 11,12-oxido compound is formed. 2,503,842. Tadeus Reichstein.

2-(mercaptoacetamido)-benzothiazole and its S-acetyl derivative. 2,503,861. Eastman Kodak Co.

Diacridyl diamine derivatives. 2,503,899. Dow Chemical Co.

Preparing s-triazines by heating a nitrile free from aliphatic unsaturation in the presence of an alcohol. 2,503,999. E. I. du Pont de Nemours & Co.

Tetrachloro-cyclooctadiene obtained by heating 2,3-dichloro-1,3-butadiene in the presence of phenothiazine and a nickel cyanide catalyst. 2,504,016. E. I. du Pont de Nemours & Co.

Catalytically hydrogenating 1,4-dicyanobutenes to hexamethylenediamine by heating 1,4-dicyanobutene and hydrogen in the presence of a cobalt hydrogenation catalyst. 2,504,024. E. I. du Pont de Nemours & Co.

Preparation of maleic acid by selectively oxidizing a gaseous mixture of C4 diolefins, consisting essentially of methyl pentadienes, with air in the presence of a vanadium oxide catalyst. 2,504,034. Standard Oil Development Co.

Separating aliphatic nitriles, water, ammonia, and hydrogenation-inhibiting impurities. 2,504,045. Armour and Co.

Polyethyleneglycol ethers of bis(di-alkyl-hydroxyphenyl)-methane. 2,504,064. Rohm & Haas Co.

Producing octachlorothiolane by contacting liquid thiophene with excess chlorine in the presence of iodine, iodine monochloride, or iodine trichloride. 2,504,068. Socony-Vacuum Oil Co., Inc.

2,2,3,4,5,5-hexachlorothiolane. 2,504,083. Socony-Vacuum Oil Co., Inc.

2,2,3,4,5,5-hexachloro-3-thiolene. 2,504,084. Socony-Vacuum Oil Co., Inc.

In production of a nuclear iodo-substituted derivative of an anthanthrone by replacement of nuclear hydrogen with iodine by heating with iodine in oleum, the improvement which comprises carrying out the reaction at a pressure at least equal to the pressure autogenously produced by the reaction mixture. 2,504,088. General Aniline & Film Corp.

Asymmetrical sulfolanyl ethers of heterocyclic alcohols. 2,504,098. Shell Development Co.

Cyclohexyl ethers of cyclic sulfones. 2,504,099. Shell Development Co.

Aluminum methionate. 2,504,107. Purdue Research Foundation.

Production of alkyl diaryl esters of ortho phosphoric acid by reacting a primary aliphatic alcohol with phosphorus oxychloride to form a monoalkyl phosphoryl dichloride and adding a sodium arylate and recovering monoalkyl diaryl ester of orthophosphoric acid. 2,504,121. Monsanto Chemical Co.

N-allyl-1,2-diphenylethylamine. 2,504,122. George A. Breon & Co.

Monoalkyl saturated aliphatic dicarboxylic ester of 2-hydroxycyclohexanone in which the aliphatic dicarboxylic residue has a hydrocarbon residue containing from 2 to 8 carbon atoms. 2,504,135. Monsanto Chemical Co.

Preparing methyl beta-furfuryloxypropionate by mixing methyl acrylate with furfuryl alcohol having dissolved therein sodium. 2,504,151. U.S.A. as represented by the Secretary of Agriculture.

Producing tetraethyl pyrophosphate by associating diethyl halogen-phosphate with water. 2,504,165. Victor Chemical Works.

Dealkylation of alkyl pyridine by treating alkylated pyridine compounds with a reactive aromatic compound in the presence of a dealkylation catalyst. 2,504,172. Phillips Petroleum Co.

Recovery of acetic anhydride from an oxidation reaction mixture containing acetic anhydride in admixture with acetic acid, water and percompounds at a pressure between 80 mm. and 200 mm. Hg whilst carrying out the distillation so that the liquid in the kettle at the base of the column contains not more than 30% by weight of acetic acid in addition to acetic anhydride. 2,504,195. Distillers Co., Ltd.

In preparation of a 4-alkoxybutanol-1 by the hydrodealkanolization of 3,4-dialkoxy-substituted aliphatic monocarboxylic acid esters, the step which comprises subjecting such an ester to hydrogenation. 2,504,407. E. I. du Pont de Nemours & Co.

In production of an alkanesulfonate by the reaction of an olefin with bisulfite ions in aqueous solution, the improvement which comprises conducting the reaction in the presence of a reaction initiator-mutual solvent pair of the group consisting of 2,2-bis(tertiary-butylperoxy) butane with methanol, tertiary-butyl perbenzoate with methanol, tertiary-butyl perbenzoate with benzonalmine, tertiary-butyl perbenzoate with ethanol, tertiary-butyl perbenzoate with pyridine, 2,2-bis(tertiary-butylperoxy) butane with pyridine, or di-tertiary-butyl peroxide with pyridine. 2,504,411. Shell Development Co.

In separating pure methionine from methionine nitrile hydrolysis products, the steps which comprise extracting an aqueous solution of methionine nitrile hydrolysis products with an alcohol of the class consisting of benzyl alcohol, cyclopentanol, cyclohexanol, methyl cyclohexanol, phenyl ethyl alcohol, and n-butanol, and thereafter separating methionine. 2,504,425. E. I. du Pont de Nemours & Co.

Preparation of ethyleneurea by introducing into a silver lined tubular reaction converter a mixture containing urea, water, and an excess of ethylene diamine. 2,504,431. E. I. du Pont de Nemours & Co.

Haloethyl amides of alkoxyacetic acids. 2,504,477. Karl H. Weber and Lowell B. Kilgore.

Catalyst for the dehydrogenation of alcohols which comprises a cavernous skeleton catalytic mass formed of an aluminum-copper alloy. 2,504,497. Societe Normande de Produits Chimiques.

Production of cyclohexanol by reacting cyclohexene with sulfuric acid, diluting the resultant reaction mixture with sufficient water to cause the mixture to separate into layers upon standing, separating into layers, steam distilling the upper layer to hydrolyze the cyclohexyl acid sulfate and recover cyclohexanol and cyclohexene. 2,504,517. Allied Chemical & Dye Corp.

New composite drying composition, being a mixed ester of maleic anhydride, oleic acid and a high molecular weight resinous polymeric polyhydric alcohol which is a polymeric polyether derivative of 4,4'-dihydroxydiphenyl-2,2-propane. 2,504,518. Devoe & Raynolds Co., Inc.

Production of hydrogenation derivatives of dypnone from acetophenone by heating the acetophenone in the presence of a finely divided nickel catalyst. 2,504,558. A. Boake Roberts and Co. Ltd.

Podocarpinol. 2,504,612. Pierce Laboratory, Inc.

In the direct hydration of olefins, the step comprising effecting hydration in the presence of an HF treated, activated montmorillonite catalyst. 2,504,618. Shell Development Co.

Preparation of beta-methoxy-isobutyraldehyde by preparing a mixture of alpha methacrolein, methanol and adding this mixture to dry methanol containing sodium methoxide, hydroquinone and water, neutralizing the reaction product with sulfuric acid and recovering the beta-methoxy-isobutyraldehyde by distillation. 2,504,680. E. I. du Pont de Nemours & Co.

In the synthesis of a carbinol by the Oxo process wherein the synthesis is carried out continuously in a plurality of stages in separate reaction zones. 2,504,682. Shell Development Co.

Condensing formaldehyde with propylene in the presence of an aqueous boron fluoride catalyst to isolate 4-methyl meta-dioxane. 2,504,732. Standard Oil Development Co.

Tetrahydropyryl-6-monoacetate. 2,504,797. Imperial Chemical Industries Ltd.

Manufacture of the leuco sulphuric ester derivative of 1:4-dibenzoylaminoanthraquinone by treating 1:4-dibenzoylaminoanthraquinone, in the presence of a cuprous salt, a tertiary base and copper, with sulphur trioxide, until the leuco sulphuric ester derivative of 1:4-dibenzoylaminoanthraquinone is formed. 2,504,806. Imperial Chemical Industries Ltd.

Reacting ammonia and an isopropyl sulfate to form isopropyl amines. 2,504,807. Allied Chemical & Dye Corp.

Recovery of pure orthoxylene from drip oil by fractionally distilling said

drip oil and recovering a concentrated xylene fraction, washing said xylene fraction with concentrated sulfuric acid and neutralizing the acid-washed fraction, fractionally distilling the acid-washed, neutralized xylene fraction and recovering as distillate a concentrated orthoxylene fraction and rectifying the vapors in the presence of sufficient methyl ether of ethylene glycol. 2,504,830. Allied Chemical & Dye Corp.

Producing 4-hydroxyquinolines. 2,504,875. U.S.A. as represented by the Secretary of War.

Preparation of intermediate compounds suitable for conversion into substituted hydroxyquinolines. 2,504,895. U.S.A. as represented by the Secretary of War.

Preparing intermediates suitable for conversion into nuclear substituted heterocyclic compounds. 2,504,896. U.S.A. as represented by the Secretary of War.

Producing an olefinic compound comprising reacting hydrogen in the presence of a metallic catalyst from the group consisting of copper and iron, with the vapors of a saturated polychlorohydrocarbon having from 2 to 3 carbon atoms and at least one chlorine atom on each of two adjacent carbon atoms. 2,504,919. E. I. du Pont de Nemours & Co.

Paper & Pulp

In removing organic coloring matter from paper pulp by washing the pulp after digestion but before bleaching with a **solution** consisting of water and molecularly dehydrated alkali metal **phosphate.** 2,502,330. Clarence E. Libby.

Producing paper impervious to oil, grease, organic solvents, aromatic odors and gases by covering the face of a paper base with a continuous viscous coating consisting of hydroxy ethyl cellulose insoluble in water but soluble in aqueous sodium hydroxide. 2,502,782. Donald Robert Erickson.

Producing coated paper consisting of a continuous film of filler interspersed in binder by means of which the filler is retained on the base comprising completely covering the face of a paper with a continuous viscous coating consisting of filler dispersed in a solution of binder consisting of hydroxy alkyl cellulose soluble in aqueous sodium hydroxide but insoluble in water. 2,502,783. Donald Robert Erickson.

Catalytic bleaching of vegetable fiber pulp with an aqueous solution containing a chlorite of a metal of the class consisting of the alkali metals and the alkaline earth metals, and a catalyst comprising a water soluble salt of a metal of the class consisting of cobalt, nickel, and manganese. 23,218. Ecusta Paper Corp.

Petroleum

A hydrocarbon fuel, lead tetraethyl, and 1,1-dichloro-2,3-chloro-4,4-dichloro butadiene-1,3. 2,501,678. Standard Oil Development Co.

Catalytically synthesising hydrocarbons from hydrogen and carbon monoxide. 2,501,695. Texas Co.

Mineral lubricating oil containing a complex formed by heating an oil-soluble metal petroleum sulfonate with an inorganic base selected from the group consisting of metal oxides, hydroxides, carbonates and bicarbonates. 2,501,731. Union Oil Co. of Calif.

Mineral lubricating oil containing a complex formed by heating an oil-soluble lead petroleum sulfonate with an inorganic base selected from the group consisting of lead oxides, hydroxides, carbonates and bicarbonates to impart detergency. 2,501,732. Union Oil Co. of Calif.

Phenate compounded oils. 2,501,991. Calif. Research Corp.

Lubricating oils containing a phenate having the structure R-O-A-O-M, in which A is an aromatic nucleus, M represents an alkaline earth metal, R is a hydrocarbon radical and a selenium compound having the formula R_1-(Se)m-R_2, wherein R_1 and R_2 are hydrocarbon radicals. 2,501,992. Calif. Research Corp.

Use of mobile catalysts in the isomerization of hydrocarbons. 2,502,008. Phillips Petroleum Co.

In producing motor fuel from an isoparaffin and a mixture of 1- and 2-olefins, the improvement which comprises using as the liquid isomerization catalyst aqueous hydrofluoric acid. 2,502,015. Phillips Petroleum Co.

Catalytic alkylation of isoparaffins with olefins by maintaining liquid hydrogen fluoride and introducing a charge mixture of isoparaffin and olefin. 2,502,333. Socony-Vacuum Oil Co., Inc.

Lubricating composition comprising an oleaginous lubricating material and a sulfur-free phosphorizing agent with a high molecular weight unsaturated cyclic ketone fraction containing at least 12 carbon atoms. 2,502,408. Shell Development Co.

Increasing the octane number of thermally cracked gasoline by isomerization of olefins by the action of a catalyst comprising magnesium chromate, silica and a metal oxide selected from the group consisting of alumina, zirconia and magnesia. 2,502,565. Universal Oil Products Co.

Simultaneous hydrogenation and dehydrogenation of petroleum hydrocarbon products in a catalytic cracking zone. 2,502,958. Standard Oil Development Co.

Resolving an emulsion of a mineral oil and water by suspending in admixture with said emulsion finely divided solid particles of wood. 2,503,014. Standard Oil Development Co.

Separating a hydrocarbon from an organic nitrite by extracting a mixture of said compounds with a saturated polar oxygenated organic compound containing a dissolved salt of a metal selected from the class consisting of the alkali and alkaline earth metals. 2,503,119. Union Oil Co. of Calif.

Refined Trinidad lake asphalt containing in suspension a portion of the mineral matter naturally contained in crude Trinidad lake asphalt. 2,503,175. Barber Oil Corp.

Asphaltic composition comprising an asphalt-in-water emulsion and RSO_3X, wherein R is an aliphatic-substituted diphenylether group and X is a hydrophilic salt-forming radical selected from the class consisting of the alkali metals, ammonium, and organic substituted ammonium. 2,503,246. Lubrizol Corp.

Lubricant comprising an oil of lubricating viscosity and 2,2,3,4,5,5-hexachlorothiolane. 2,503,290. Socony-Vacuum Oil Co., Inc.

Method of synthesizing hydrocarbons and oxygenated organic compounds from carbon monoxide and hydrogen, the improvement which comprises passing a reactant mixture into contact with a catalyst consisting of cobalt in association with thoria free from alkali metal compounds, and passing effluent from said catalyst into contact with additional catalyst consisting of metallic cobalt in association with thoria and containing sodium carbonate. 2,503,356. Texas Co.

Desulfurization of a normally liquid saturated hydrocarbon containing alkyl disulfides by contacting with elemental halogen thereby converting said disulfides to the corresponding alkyl sulfenyl halides, and separating said alkyl sulfenyl halides from said hydrocarbons. 2,503,486. Phillips Petroleum Co.

Treating gasoline type hydrocarbons containing mercaptans by reacting a portion of the mercaptans with cuprous chloride to form cuprous mercaptides and dissolving said cuprous mercaptides in a glycol ether containing solution. 2,503,627. Phillips Petroleum Co.

Synthesis of hydrocarbons from hydrogen and carbon monoxide. 2,503,724. Texaco Development Corp.

Barium soap grease compositions. 2,503,749. Texas Co.

Preparing a catalyst adapted for a Fischer-Tropsch synthesis by forming a mixture of finely divided iron and alkali metal nitrate, igniting, subjecting the reaction product to a free oxygen-containing atmosphere at an elevated temperature and subsequently contacting the oxidized mixture with a reducing atmosphere. 2,503,963. Standard Oil Development Co.

Preparing a catalyst for Fischer-Tropsch synthesis by forming a mixture of finely divided iron and alkali metal nitrate, igniting, adding the ignited mixture to iron oxide, subjecting the mixture of iron oxide and ignited mixture to a free oxygen containing atmosphere at an elevated temperature and subsequently contacting the oxidized mixture with a reducing atmosphere at an elevated temperature. 2,503,964. Standard Oil Development Co.

Lubricating grease composition consisting of mineral base lubricating oil containing the sodium soap of rapeseed oil, phenyl alpha naphthylamine, and dibenzoyl acetone alkylene diamine. 2,503,969. Standard Oil Development Co.

Removing inorganic salts from water-free crude petroleum by heating and contacting the heated crude petroleum with a bed of halide of a metal selected from the left-hand column of group II of the periodic table. 2,503,977. Standard Oil Development Co.

Desulfurizing hydrocarbon oil by subjecting said oil to the action of catalyst consisting of alloys of nickel and silver, and zinc and lead respectively. 2,504,058. Henry M. Unschuld and Joseph G. Alther.

Mineral oil composition comprising mineral oil and, to improve the extreme pressure characteristics, 2,2,3,4,5,5-hexachloro-3-thiolene. 2,504,085. Socony-Vacuum Oil Co., Inc.

Revivifying clay type catalysts which have suffered loss inactivity due to use in cyclic hydrocarbon conversion systems wherein it is cyclically contacted with sulfur bearing hydrocarbon reactants; subjecting said catalyst after removal of the carbonaceous contaminant deposits thereon by burning to a temperature of at least 1050° F. but less than about 1425° F. in an atmosphere of low moisture content. 2,504,102. Socony-Vacuum Oil Co., Inc.

Deleading gasoline containing tetraethyl lead by adding a perhydrohalide capable of yielding a hydrogen halide, and then treating the mixture with charcoal to adsorb the reaction product. 2,504,134. U. S. A. as represented by the Secretary of the Army.

Hydrocarbon conversion with Eccles kaolin under catalytic cracking conditions, said Eccles kaolin containing SiO_2 and Al_2O_3. 2,504,158. Houdry Process Corp.

Isomerization of normally liquid paraffin hydrocarbon while inhibiting cracking conversion by admixing a low boiling cyclic hydrocarbon selected from the group consisting of aromatic hydrocarbons and naphthenic hydrocarbons to inhibit said cracking conversion, contacting the resultant mixture with a catalyst consisting of liquid, anhydrous hydrogen fluoride. 2,504,280. Standard Oil Co.

Supplementary anti-detonant fuel for periodic introduction into a main hydrocarbon power fuel-air mixture and consisting essentially of tetraethyl lead, and an aqueous solution consisting of methanol and the balance water. 2,504,361. Thompson Products, Inc.

Improved process for the manufacture of motor fuels by treating an admixture of hydrocarbons comprising naphtha, added C_3 and C_4 gases and refractory gas oil to reform the said naphtha and crack the said refractory gas oil. 2,504,415. Phillips Petroleum Co.

Recovery of hydrocarbons from natural gas with absorption oil. 2,504,429. Phillips Petroleum Co.

Composition for use as a power transmission fluid comprising a mineral oil and at least one detergent additive from the group consisting of oil soluble metal salts of sulphonic acids, oil-soluble metal salts of alkyl phenol thioethers, oil-soluble metal salts of wax alkylated phenols and oil-soluble metal salts of fatty acids. 2,504,552. Tide Water Associated Oil Co.

Lubricating grease comprising: a mineral lubricating oil, a lithium soap to substantially thicken said oil and a zinc dialkyl dithiocarbamate. 2,504,672. California Research Corp.

An anhydrous, reversible lubricating grease consisting of a low cold test mineral oil thickened to a smooth homogenous solid grease structure with barium soap of fatty acid having 12 to 24 carbon atoms, being prepared by dissolving said fatty acid in said mineral oil, adding an aqueous-oil slurry of carbonate-free barium hydroxide and heating to form barium soap in situ. 2,504,717. Standard Oil Development Co.

Preparing an addition agent for mineral oil lubricants which comprises heating a monohydric phenol having at least one unsubstituted nuclear position, N-dimethylaniline and formaldehyde in the presence of an activated clay catalyst. 2,504,742. Gulf Oil Corp.

Preparing an addition agent for mineral oil lubricants which comprises heating p-hydroxydiphenyl with N-dimethylaniline and formaldehyde in the presence of an activated clay catalyst. 2,504,743. Gulf Oil Corp.

Lubricating grease composition consisting of lubricating oil, a thickener to impart a colloidal grease structure, and a "cycalkene" copolymer. 2,504,779. Standard Oil Development Co.

Photographic

Photoprinting material comprising a light-sensitive layer on a suitable carrier containing cupric formate and a member of the group consisting of anthraquinone 2,6-disulfonic acid, anthraquinone 2,7-disulfonic acid and the alkali-metal salts thereof. 2,504,593. General Aniline & Film Corp.

Photographic emulsions containing N-aryloxy-, arylthio-, and arylselenoalkyl cyanine dyes. 2,504,615. General Aniline & Film Corp.

Photographic emulsions containing heterocyclic nitrogenous cyanine dyes having a new group attached to the nitrogen atom thereof. 2,504,616. General Aniline & Film Corp.

Polymers

Preparing a thermo-setting resin having water and alkali resistant properties by dissolving alkali soluble lignin in an ether compound, adding an amino-triazine and formaldehyde, and subjecting the solution to heat. 2,501,665. Masonite Corp.

Resinous product which comprises the heat reaction product under acid conditions of lignin, formaldehyde and a condensation product of furfural and acetone. 2,501,666. Masonite Corp.

Aqueous emulsion polymerization of ethylenic unsaturates in the presence of diazo-thio-ethers. 2,501,692. Phillips Petroleum Co.

In polymerizing an ethylenically unsaturated polymerizable organic compound, the step which comprises effecting said polymerization reaction in the presence of a diazo thioether. 2,501,693. Phillips Petroleum Co.

Water-soluble urea resins. 2,501,783. Arnold, Hoffman & Co., Inc.

Thermosetting resin comprising the reaction product of formaldehyde with the unhydrolyzed copolymer of vinyl lactate and methyl acrylate. 2,501,990. Monsanto Chemical Co.

Making an alcohol-soluble resinous material by adding styrene to an agitated heating mixture of phenol and a boron trifluoride catalyst. 2,502,003. Neville Co.

Solution comprising polyacrylonitrile, a solvent for polyacrylonitrile which generates an organic amine upon heating, a color free acidic compound from the group consisting of organic acids, inorganic acids, anhydrides and organic acid halides. 2,502,030. E. I. du Pont de Nemours & Co.

Composition consisting of an aqueous dispersion of rosin, an alkali rosinate, and a petroleum resin derived by solvent treatment of petroleum distillation residues through the addition of a lower hydrocarbon solvent in an amount to precipitate therefrom the asphalt content thereof and subsequent addition of a further quantity of the lower hydrocarbon solvent to precipitate the desired petroleum resin therefrom. 2,502,080. Hercules Powder Co.

Polyamide cold bonded laminate. 2,502,340. E. I. du Pont de Nemours & Co.

Polyvinyl chloride compositions containing pentaerythritol tetrabenzoate. 2,502,370. Monsanto Chemical Co.

Polyvinyl chloride compositions containing diphenyl phthalate. 2,502,371. Monsanto Chemical Co.

Copolymer of zirconyl methacrylate and an ester of methacrylic acid and a saturated monohydric aliphatic alcohol of 1 to 4 carbon atoms. 2,502,411. Rohm & Haas Co.

Producing a synthetic resin for use as a mounting for microscopic media, by reacting naphthalene and formaldehyde in the presence of an acid catalyst. 2,502,446. William D. Fleming.

Linoleum composition comprising a siccative oil gel, a filler, and a mixture containing a copolymer of vinyl chloride and vinyl acetate in which 20% to 50% of the acetate groups have been hydrolyzed, and a plasticizer. 2,502,457. Armstrong Cork Co.

Lignocellulose phenol formaldehyde, and inorganic filler molding composition. 2,502,498. U. S. A. as represented by the Secretary of Agriculture.

Resorcinol aldehyde resinous compositions. 2,502,511. British Resin Products, Ltd.

Preparation of molding powder consisting essentially of starch and an aminotriazine-formaldehyde resin. 2,502,520. A. E. Staley Mfg. Co.

Production of linear polyamides by heating in m-cresol a, a' di-primary-amino-sebacic acid ethyl ester. 2,502,548. Celanese Corp. of America.

Production of linear polyamides by condensing the di-formyl derivative of a di-primary diamine, in which the formyl-amino groups are the sole reactive groups, with 1,3,5-pentane-tricarboxylic acid until a linear fiber-forming polymer is obtained. 2,502,576. Celanese Corp. of America.

Reacting blown nondehydrated castor oil with maleic anhydride. 2,502,606. Rachel Mifflin Ullmann.

Polymerized diester of a conjugated cyclohexadiene dicarboxylic acid 1,2 having only carboxyl groups as reactive substituents and a saturated monohydric aliphatic alcohol having from 4 to 12 carbon atoms and having only a hydroxyl group as a reactive substituent. 2,502,644. California Research Corp.

Polymeric ester of a conjugated cyclohexadiene dicarboxylic acid 1,2 selected from the group consisting of $\Delta 3,5$ cyclohexadiene dicarboxylic acid 1,2 and $\Delta 2,6$ cyclohexadiene dicarboxylic acid 1,2 and ethylenically unsaturated monohydric aliphatic alcohol having from 2 to 20 carbon atoms and having only a hydroxyl group as a reactive substituent. 2,502,645. California Research Corp.

Producing hard transparent amorphous resins by reacting 2-3 butanediol with phthalic anhydride. 2,502,686. The Honorary Advisory Council for Scientific and Industrial Research.

Preparation of polyvinyl alcohol consisting of the alcoholysis, with methanol, of a polyvinyl ester of an unsubstituted lower aliphatic monocarboxylic acid, in the presence of an alkaline alcoholysis catalyst. 2,502,715. Shawinigan Chemicals Ltd.

Treating polyethylene films by subjecting the surface to the action of gaseous chlorine to form a superficially chlorinated polyethylene surface, and then imprinting such chlorinated surface with a printing ink. 2,502,841. Visking Corp.

Unsaturated alkyd reacted with unsaturated isocyanate. 2,503,209. American Cyanamid Co.

A polymer of acrylonitrile containing acrylonitrile, N, N-dimethylformamide, and an inorganic phosphorus compound selected from the group consisting of oxygen acids of phosphorus and oxides of phosphorus. 2,503,244. Eastman Kodak Co.

Polymer of acrylonitrile containing acrylonitrile, N,N-dimethylformamide and an organic compound selected from the group consisting of oxalic acid, acetic acid, acetic anhydride, trifluoroacetic acid, alkane sulfonic acids, aromatic sulfonic acids, alkyl acid esters of acids of phosphorus, alkane phosphonic acids and alkene phosphonic acids. 2,503,245. Eastman Kodak Co.

In replacement by halogen of hydrogen of polymethylene, the improvement wherein there is employed as initiator an aliphatic azo compound. 2,503,252. E. I. du Pont de Nemours & Co.

Polymerizing rosin by treating rosin in liquid phase with a catalytic material selected from the group consisting of the iron chlorides and iron bromides, in combination with a halogen-containing material capable of providing free hydrogenhalide. 2,503,263. Glidden Co.

Polymerizing rosin by treating rosin in liquid phase with a catalytic material selected from the group consisting of the copper chlorides and copper bromides, in combination with hydrogen chloride or hydrogen bromide. 2,503,264. Glidden Co.

In recovery of polymerized styrene from aqueous emulsions thereof emulsified with emulsifying agents of the group consisting of water-soluble alkali metal salts of sulfonated and sulfated organic compounds, precipitating by adding an aqueous solution containing an alkali of the fixed alkali group and then washing. 2,503,338. Celanese Corp. of America.

Production of polyallyl acetoxyacetate by heating allyl acetoxyacetate in liquid phase in the presence of a peroxide polymerization catalyst. 2,503,699. Shell Development Co.

Polymeric polyhydric alcohols having a plurality of alternating aliphatic and aromatic nuclei united through ether oxygen, the aliphatic nuclei containing a plurality of hydroxyl groups, and said alcohols containing from 4 to 40 hydroxyl groups per molecule, said polymeric polyhydric alcohols being solids insoluble in water and having a softening point within the range of about 80° to 200° C. 2,503,726. Devoe & Raynolds Co., Inc.

Compositions of polyvinyl acetals and polymeric 4-vinylcyclohexene dioxide. 2,503,873. Canadian Industries Ltd.

Composition consisting of a mixture of alkyl polysiloxaneamines comprising the product of reaction between anhydrous ammonia and an alkyl-

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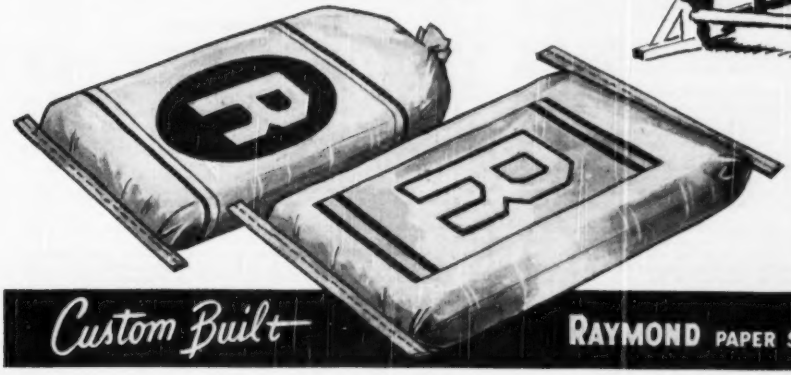

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chloropolysiloxane containing terminal silicon-bonded chlorine atoms. 2,503,919. General Electric Co.

Preparation of polymethacrylic acid by dissolving an ester of polymethacrylic acid in an excess of sulfuric acid, aging then diluting the aged acid solution with water and isolating therefrom the polymethacrylic acid so obtained. 2,504,049. E. I. du Pont de Nemours & Co.

Allylic fumarate-allylic alcohol interpolymers. 2,504,052. U. S. Rubber Co.

Acrylonitrile-isobutylene copolymer plasticized with the strong base-catalyzed reaction product of acrylonitrile with a clear, viscous, resinous alkaline-catalyzed condensation product of a ketone selected from the group consisting of saturated aliphatic ketones, saturated alicyclic ketones and aromatic ketones. 2,504,054. U. S. Rubber Co.

Interpolymers of acrylamide and methacrylamide. 2,504,074. General Aniline & Film Corp.

Polymers of acrylic esters of alkoxy-3-butenols. 2,504,082. Rohm & Haas Co.

Preparing light colored to white thermosetting resins of the phenol-aldehyde type by condensing phenol and formaldehyde in the presence of boron trifluoride. 2,504,100. Socony-Vacuum Oil Co., Inc.

Polyvinyl chloride resin containing a monalkyl diaryl phosphate ester. 2,504,120. Monsanto Chemical Co.

Preparing polyethylene wax compositions comprising milling an ethylene polymer with a petroleum wax to obtain a homogeneous blend and then dissolving said blend in petroleum wax to obtain a complete solution of the ethylene polymer in the petroleum wax. 2,504,270. Standard Oil Co.

Composition of matter composed of a siloxane resin having methyl and phenyl radicals, lead 2-ethyl hexoate, and dibutyl tin diacetate. 2,504,388. Dow Corning Corp.

Production of at least medium hard, high-melting waxes from ethylene under pressures between about 425 and 475 atmospheres and at temperatures between about 140° C. and 200° C. in contact with isopropanol and containing hydrogen peroxide. 2,504,400. Allied Chemical & Dye Corp.

Moisture resistant laminated sheet comprising sheets of regenerated cellulose bonded face to face by a composition comprising a thermoplastic, unsaponifiable, neutral polymerized β-pinene resin. 2,504,417. E. I. du Pont de Nemours & Co.

Preparing chewing gum grade polyvinyl acetate by mixing a catalyst solution, having acetyl peroxide, in a solvent of the group consisting of toluene and vinyl acetate, with a mixture of vinyl acetate, under polymerizing conditions and recovering the polyvinyl acetate. 2,504,436. Shawinigan Chemicals Ltd.

Producing aqueous dispersions of polyvinyl acetal resins which contain water in the presence of a dispersing agent taken from the group consisting of the ammonium, alkali metal and amine salts of long chain fatty acids, by mixing the polyvinyl acetal resin with a plasticizer and the acid component of the dispersing agent, cooling the mixture, adding the alkaline component of the dispersing agent and thereafter adding water with constant agitation to invert the dispersion. 2,504,667. Monsanto Chemical Co.

Copolymeric organosiloxane which is composed of structural units $C_6H_5SiO_{3/2}$ and structural units $RSiO_{3/2}$, where R is higher alkyl radical having at least seven carbon atoms, the silicon atoms of said organosiloxane being joined together by oxygen atoms through siloxane linkages. 2,504,839. Corning Glass Works.

Polyvinyl chloride resin plasticized with 1,5-pentanediol-biscyclohexyl acetate. 2,504,929. Sun Oil Co.

Polyvinyl chloride resin plasticized with 1,5-pentanediol difuroate. 2,504,930. Sun Oil Co.

Rubber

Rubberlike cement consisting of an alcohol dispersion of rubberlike material taken from the class consisting of reclaimed rubber and polychloroprene and ethyl alcohol including shellac as a dispersing agent. 2,501,554. General Motors Corp.

Stabilization of synthetic elastomers by incorporating a polymeric thiophene amine. 2,502,391. Socony-Vacuum Oil Co., Inc.

In copolymerization of a conjugated diolefin with an aryl alkene to form a high molecular weight elastic hydrocarbon copolymer of said conjugated diolefin and said aryl alkene, the improvement which comprises conducting said copolymerization in the presence of lead tetraethyl. 2,502,444. Houdry Process Corp.

In producing a dense rubbery article, the improved step which comprises adding an alloy of bismuth, lead, tin and cadmium to a rubbery copolymer of isobutylene and a conjugated diolefin, and vulcanizing the resulting composition. 2,502,949. Standard Oil Development Co.

Production of cellular material from elastomeric copolymers prepared by the copolymerization of isobutylene with isoprene by the application of a dissolved Friedel-Crafts active metal halide catalyst. 2,503,003. Standard Oil Development Co.

Synthetic rubber of a butadiene hydrocarbon and ortho-N-acrylyl or methacrylyl amino biphenyl. 2,503,195. Monsanto Chemical Co.

Vulcanized article free from sulfur bloom comprising a sulfur covulcanizate of a rubbery copolymer of an isomonoolefin having from 4 to 7 carbon atoms with an open-chain conjugated diolefin having from 4 to 8 carbon atoms and a rubbery copolymer of chloroprene with an open-chain conjugated diolefin having from 4 to 8 carbon atoms. 2,503,637. B. F. Goodrich Co.

In polymerizing cyclopentadiene to obtain a synthetic rubbery material, the step of carrying out the polymerization at a temperature below 0° C. in the presence of a complex of boron fluoride and an ether. 2,503,972. Libbey-Owens-Ford Glass Co.

Chlorinated rubber powder admixed with an organic volatile solvent, and a phospholipide. 2,504,065. Wingfoot Corp.

Rubber-like product obtained by heating an omega-hydroxy saturated aliphatic carboxylic acid with a glycol acid ester of an alpha,beta-unsaturated dicarboxylic acid in the presence of an organic peroxide catalyst. 23,220. American Cyanamid Co.

Curing a sulfur vulcanizable rubbery copolymer obtained by the emulsion copolymerization of butadiene-1,3 and acrylonitrile by heating the copolymer without sulfur in the presence of the copolymer of a long chain alkyl chloride containing at least 10 but not more than 16 carbon atoms. 2,504,295. Monsanto Chemical Co.

Decreasing the resistance to flow of unvulcanized rubber comprising incorporating a compound selected from the group consisting of unsubstituted α-thienyl mercaptan, its corresponding disulfide, its zinc salt, and its esters derived from carboxylic acids containing 1 to 8 carbon atoms. 2,504,903. E. I. du Pont de Nemours & Co.

Specialties

Preventing the autoxidation of edible fats, oils, and of foodstuffs by adding tetra alkylthiuram disulphide. 2,502,109. Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek.

Hydraulic fluid consisting of a mixture of hexachlorobutadiene and isopropyl trichlorobenzene. 2,502,392. Hooker Electrochemical Co.

Rendering thin strips of wood flexible by applying to the surface powdered $Na_2SnO_3 \cdot 5H_2O$ and immersing in a vaporous atmosphere of steam. 2,503,443. Allied Chemical & Dye Corp.

Conditioning a dry cleaning solvent to avoid linting and dusting in the dry cleaning of fabrics by contacting said solvent with a powdered diatomaceous earth filter aid containing an oleic acid soap of a metal selected from the group consisting of magnesium, calcium, zinc, strontium, cadmium and barium. 2,503,744. Great Lakes Carbon Corp.

Preservation of timber which comprises forming in contact with the timber a compound of a sulphonic acid of the group consisting of a phenol sulphonic acid, an alkyl phenol sulphonic acid, a carboxyl phenol sulphonic acid, benzene sulphonic acid, diphenyl mono- and di-sulphonic acids, naphthalene mono- and di-sulphonic acids, sulphobenzoic acid, a hydroxynaphthalene sulphonic acid, an alkyl substituted naphthalene sulphonic acid, an alkyl substituted hydroxynaphthalene sulphonic acid and nuclear substituted halogen derivatives thereof, a salt forming component R_3HgA where R_3 is a radical selected from the group consisting of unsubstituted and substituted alkyl, aryl, aralkyl, and heterocyclic radicals, Hg is a mercury atom and A is an acid radical, and formaldehyde. 2,503,841. Ward Blenkinsop & Co., Ltd.

Preventing silverware from tarnishing by exposing the silverware in a confined space to vapors of the anhydrous crystalline reaction product of morpholine and carbon dioxide in an anhydrous medium. 2,503,843. Lucile D. Robertson and John W. Robertson.

Ammonium salt of polymeric N-hydroxymethyl amic acids and water-repellent compositions containing them. 2,504,003. E. I. du Pont de Nemours & Co.

In production of a solidified fuel by dissolving a nitrocellulose in a lower aliphatic alcohol and solidifying by the addition of a non-solvent for the nitrocellulose, the improvement which comprises coating discrete portions of a nitrocellulose-alcogel with a composition containing a nitrocellulose having a nitrogen content from about 10.5 to about 12%, a water-soluble alcohol as a solvent and a glyceryl phthalate. 2,504,196. Sterno, Inc.

Composition comprising wood particles extracted with ammonia in solution in water to remove ammonia-soluble substances, and hydraulic cement coating said wood particles. 2,504,579. John Perl.

Preparing a stabilized nut butter comprising introducing an hydrogenated oil stabilizer containing an edible oil which has been hydrogenated only to the point of maximum trans 9, 10 octadecenoic formation. 2,504,620. Rosefield Packing Co., Ltd.

Brazing flux consisting of oxygen containing compounds of boron, sodium, potassium and lithium. 2,504,802. Westinghouse Electric Corp.

Aqueous wax emulsion adapted to be used for treating asbestos cement building board comprising stearic acid, a water-insoluble wax, a volatile emulsifying agent and polybutene. 2,504,920. S. C. Johnson & Son, Inc.

Textiles

Manufacture of a rubberized article by treating a fabric with a solution of methyl cellulose. 2,501,988. Lea Fabrics, Inc.

Preparing coated fabrics which are highly resistant to abrasion and flexing, by coating a composition containing polychloroprene, coumarone resin and vulcanizing agents, retarders, fillers as necessary. 2,502,353. E. I. du Pont de Nemours & Co.

Light-colored rosin size of improved color stability consisting of the product obtained by saponifying with a water-soluble alkali a mixture of pale rosin and wood rosin color bodies heated in an oxygen-free atmosphere. 2,502,883. American Cyanamid Co.

Rosin size of improved color stability consisting of the product obtained by saponifying with an alkaline alkali metal compound a mixture of pale rosin and tall oil pitch heated in an oxygen-free atmosphere. 2,502,884. American Cyanamid Co.

In production of filaments from a melt of highly polymeric linear polyester obtainable from aromatic dicarboxylic acids and glycols, intensively drying preformed particles before melting. 2,503,251. Imperial Chemical Industries Ltd.

Low-crock textile-decorating composition comprising a water-in-lacquer emulsion, the lacquer phase of which comprises a pigmented colloidal dispersion of granular thermoplastic copolymer of a monovinyl aromatic compound and an aliphatic conjugated diolefin, and a solution of a thermosetting resin in a volatile organic solvent which is a nonsolvent for the copolymer but has a swelling action therefor; the copolymer comprising the product prepared by polymerizing the vinyl aromatic compound in an aqueous emulsion. 2,504,136. Interchemical Corp.

Preparing a clear, stable, water white and water soluble or dispersible resinous condensation product capable of dimensionally stabilizing cellulosic textile materials by reacting a saturated ketone selected from a group consisting of aliphatic and hydroaromatic ketones with formaldehyde in the presence of a non-volatile alkaline catalyst. 2,504,835. Reichhold Chemicals, Inc.

In imparting crease resistance to cotton fabrics, the process which consists in impregnating the fabric with an aqueous solution of a mixture of a methylol melamine and a methylated methylol melamine. 2,504,857. Joseph Bancroft & Sons Co.

Water, Sewage, etc.

In freeing water of dissolved silicon compounds, passing the water through a bed of a substantially water-insoluble anion exchange material comprising a hydrofluoride of an anion exchange agent. 2,502,120. Dow Chemical Co.

Removal of silica from aqueous fluids by adding hydrofluoric acid sufficient to convert substantially all the silica present to fluosilicic acid, bring the solution into contact with an anion exchange material for the removal of anions. 2,503,769. Dorr Co.

Removing silica from water by way of ion exchange. 2,504,695. Dorr Co.

Agricultural *

Morpholine salt of 2,4-dichlorophenoxyacetic acid. 2,505,059. J. T. Baker Chemical Co.

Insecticidal compositions containing pyrethin and rotenone extracts. 2,505,698. U. S. Industrial Chemicals, Inc.

Insecticidal compositions containing pyrethrum extracts and piperonyl cyclohexenones. 2,505,699. U. S. Industrial Chemicals, Inc.

DDT insecticide dust. 2,506,635. E. I. du Pont de Nemours & Co.

Insecticidal dusts containing 2,2-bis(4-methoxyphenyl)-1,1,1-trichloroethane. 2,506,636. E. I. du Pont de Nemours & Co.

Insecticidal composition comprising an adduct of a halogenated quinone and a conjugated cyclic diene, distended in a carrier dust. 2,507,207. Julius Hyman.

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* From Vol. 633, No. 4; Vol. 634, Nos. 1, 2, 3.

Fungicidal composition comprising a 2,4,5-trichlorophenyl chloroacetate. 2,508,335. Dow Chemical Co.

Ceramics *

Depositing silica films on a glass surface, comprising immersing a glass article in a solution of fluosilicic acid. 2,505,629. Radio Corp. of America.

Opaque, acid resistant enamel frit consisting of SiO_2, TiO_2, B_2O_3, R_2O, in which R_2O is an alkali metal oxide, PbO, F, MoO_3, and RO in which RO is an oxide selected from the class consisting of CaO, BaO, and ZnO. 2,507,691. Metal & Thermit Corp.

Clear, transparent soda-lime type glass, comprising SiO_2, Al_2O_3, CaO, Na_2O, SO_3, and F. 2,508,070. Hartford-Empire Co.

Coatings *

Coating composition of unsaturated alkyd resin from a soluble, fusible polyfumarate of ethylene glycol-diethylene glycol, and diallyl phthalate. 2,505,347. U. S. Rubber Co.

Pretreating a ferrous metal surface, by immersing said surface in an aqueous solution including: sodium dichromate, phosphoric acid, reaction product of ethylene oxide with lauryl alcohol. 2,505,785. Howard R. Moore.

Coating composition for brushing comprising a cellulose plastic taken from the class consisting of cellulose esters and ethers, a synthetic resin from the class consisting of alkyd resins modified by fatty acids of vegetable oils, and urea-melamine-formaldehyde resins, dissolved in a mixture of organic substances including readily volatile glycol ether, monohydric alcohol, alkyl acetate and non-solvent hydrocarbon. 2,506,223. Gustave Klinkenstein.

Varnish vehicle suitable for use in grinding pigments for incorporation into oleoresinous varnishes, alkyds, lacquers, and the like, consisting of a hard varnish resin-polyester oil varnish, the polyester oil comprising a completely esterified polyhydric alcohol. 2,506,695. Interchemical Corp.

In the preparation of foundry molds or cores, coating the exposed surfaces of metal chaplets with a polyorganosiloxane compound. 2,507,068. Ford Motor Co.

Protective coating composition, comprising an organic film forming material and anhydrous lead metaborate. 2,507,239. Lester Aronberg.

Protective coating composition having a film-forming synthetic resin base which consists of a mixture of an oil soluble, heat-hardening phenol-formaldehyde resin with polymerized styrene and terpene resins dissolved in a readily volatilizable mixed solvent comprising both aliphatic and aromatic hydrocarbon solvents. 2,507,665. Brogilex Co.

Polyvinyl chloride coating compositions. 2,507,688. E. I. du Pont de Nemours & Co.

Calenderable compostiion comprising a chlorosulfonated polymer of ethylene, curing agents therefor and polyoxyethylene glycol. 2,507,699. E. I. du Pont de Nemours & Co.

In coating aluminum without the evolution of gaseous hydrogen, subjecting the surface to the action of an aqueous coating agent consisting of water, hydrofluoric acid and ammonium dichromate. 2,507,956. Lithographic Technical Foundation, Inc.

Manufacturing flexible, wrinkle-coated materials comprising mixing unsaturated fatty oil with varnish solvent and aqueous dispersion of polyvinyl chloride latex; applying to a base material; and subjecting the coated material to drying. 2,508,092. New Wrinkle, Inc.

Tank lining material comprising a homogeneous mixture of a rubber and a finely divided sodium aluminum silicate. 2,508,262. E. I. du Pont de Nemours & Co.

Cellulose *

Cellulose derivative plastic composition. 2,505,039. Hercules Powder Co.

Acid ester of cellulose in which unmodified cellulose is partially esterified with a dicarboxylic acid, one of the carboxyls of which is combined with a cellulose hydroxyl group and the other remains a free acid group, for use as a cation exchange medium. 2,505,561. Abbott Labs.

Obtaining transparent effects on a fabric consisting predominantly of regenerated cellulose by treating with caustic soda in two steps. 2,506,040. Aktiengesellschaft Cilander.

Obtaining transparent effects on a fabric consisting predominantly of regenerated cellulose by treating with caustic soda then treating said fabric with sulfuric acid, removing free sulfuric acid, and then treating with hot caustic soda of mercerizing strength. 2,506,041. Aktiengesellschaft Cilander.

Multiple-step process for obtaining transparent effects on a fabric consisting predominantly of regenerated cellulose by treating with hot caustic soda of mercerizing strength, and then treating with sulfuric acid. 2,506,042 Aktiengesellschaft Cilander.

Obtaining transparent effects upon a fabric consisting predominantly of regenerated cellulose by treating with hot caustic soda of mercerizing strength, then treating with sulfuric acid and then treating with caustic soda of mercerizing strength. 2,506,043. Aktiengesellschaft Cilander.

Obtaining transparent effects on a fabric consisting predominantly of regenerated cellulose by treating with a hot caustic soda of mercerizing strength at temperatures of the order of 55° C., removing free caustic soda, and then treating with a hot caustic soda of mercerizing strength at temperatures of the order of 45° C. 2,506,044. Aktiengesellschaft Cilander.

Obtaining transparent effects on a fabric consisting of regenerated cellulose staple fibers by treating with a hot caustic soda of mercerizing strength at 50° C., removing free caustic soda, and then treating with caustic soda of mercerizing strength at —5° to 25° C. 2,506,045. Aktiengesellschaft Cilander.

Obtaining soft transparent effects on a fabric consisting predominantly of cell-wool made of regenerated cellulose, by treating with sulfuric acid and then treating with an aqueous caustic soda solution. 2,506,046. Aktiengesellschaft Cilander.

Preparing an acetone-soluble cellulose acetate propionate by heterogeneously hydrolyzing a fibrous primary cellulose acetate propionate by heating in aqueous 2% to 10% sulfuric acid until an acetone-soluble, fibrous cellulose acetate propionate is obtained containing 0.2 to 0.8 free hydroxyl groups per glucose unit; removing and treating with super-heated steam until free of combined sulfate. 2,508,013. E. I. du Pont de Nemours & Co.

Detergents *

Direct production of a purified soap powder from liquid crude sulphate soap skimmings obtained from black liquor which comprises spray-drying said liquid soap skimmings by atomizing the same into an atmosphere of heated air. 2,507,237. National Southern Products Corp.

Polyalkylene oxide compounds having surface activity. 2,508,035. Monsanto Chemical Co.

Polyalkylene oxide compounds having high wetting activity. 2,508,036. Monsanto Chemical Co.

Dyes & Pigments *

Vat dyes of benzanthrone diacridine series. 2,505,234. E. I. du Pont de Nemours & Co.

Asymmetric azo dyestuffs of the pyrazolone series. 2,505,244. J. R. Geigy A. G.

Monoazo dyestuffs. 2,505,268. Ciba Ltd.

Wool dyestuffs. 2,505,284. Imperial Chemical Industries Ltd.

Production of cyanine dyestuffs. 2,505,496. Ilford Ltd.

Production of photographic sensitizing cyanine dyestuffs. 2,505,497. Ilford Ltd.

Monoazo-dyestuffs. 2,505,533. Ciba Ltd.

Green pigment composition having a blend of a blue to green phthalocyanine pigment and a yellow alpha aromatic acylamino anthraquinone. 2,505,744. American Cyanamid Co.

Dyestuff preparation which consists of a mixture of 1-(β-hydroxyethyl)-amino-4-phenylamino-anthraquinone and 1-methylamino-4-phenylamino-anthraquinone. 2,506,020. Ciba Ltd.

Anthraquinone vat dyestuffs. 2,506,025. Ciba Ltd.

Cellulose derivative textile fibers dyed with derivatives of 1-amino-2-nitro-benzene-4-sulfamide. 2,506,224. Manufacturers de Probuits Chimiques du Nord Etablissements Kuhlmann.

Manufacture of sulfuric esters of leuco vat dyestuffs. 2,506,580. Imperial Chemical Industries, Ltd.

In coloring cellulosic fabric by applying an aqueous dispersion of an organic pigment and a bonding agent comprising a methacrylic ester polymer followed by drying of the treated fabric, the improvement which consists of adding ammonium polymethacrylate to improve the levelness of color on the resulting dyed fabric. 2,506,892. Imperial Chemical Industries Ltd.

Dyestuffs of the anthraquinone acridone series. 2,507,479. General Aniline & Film Corp.

Amino-anthraquinone-carboxylic-amide dyes. 2,507,574. Celanese Corp. of America.

Obtaining rutile TiO_2 nucleating agent useful in titanium salt solution hydrolyses by digesting an alkaline earth metal titanate in the presence of a monobasic acid which decomposes the acidified titanate and converts its TiO_2 content to rutile. 2,507,729. E. I. du Pont de Nemours & Co.

Polyazo dyestuffs. 2,507,754. J. R. Geigy A. G.

Production of water-soluble sulfuric ester salts of leuco vat dyes by reacting a leuco vat dye with the sulfur trioxide addition compound of a tertiary amine. 2,507,944. General Aniline & Film Corp.

Dyeing animal hairs with anthraquinone vat dyestuffs. 2,508,203. Allied Chemical & Dye Corp.

Heterocylic nitrogenous cyanine dyes containing a new group added to the nitrogen atom thereof. 2,508,324. General Aniline & Film Corp.

Producing carbocyanine dyes by heating a cyclammonium quarternary salt of the type usual in the preparation of cyanine dyes and containing a reactive methyl group in the 2-position of the nitrogen atom thereof with an orthoester of a carboxylic acid. 2,508,325. General Aniline & Film Corp.

Inorganic *

Impregnating a hygroscopic siliceous gel with a solution of impregnant by admixing with ice to produce a hydrated gel, permitting the mixture to stand until the gel is substantially saturated with water and treating the resultant product with a solution of impregnant agent. 2,505,079. International Minerals & Chemical Corp.

Preparing a rutile calcination seeding agent which comprises preparing titanium phosphate by reacting a titanium compound with phosphoric acid, reacting the titanium phosphate with an alkali metal alkali, washing the resulting alkali metal titanate free of alkali phosphates, reacting the resulting substantially PO_4 ion-free alkali metal titanate with an aqueous inorganic monobasic acid to convert the alkali metal to the salt of the monobasic acid and theoretically about 50% of the titanium content to the salt of the monobasic acid, and boiling the resultant mixture, whereby the titanium content is converted to a rutile seed. 2,505,344. American Cynamid Co.

Plant for the electrolysis of alkali salt solutions with a mercury cathode. 2,505,466. Solvay & Cie.

Zinc cadmium sulfoselenide phosphors. 2,505,621. Radio Corp. of America.

Preparing gel catalysts in the form of discrete rounded particles by dispersing hydrosol in the form of droplets in a coagulating bath consisting of a liquid incompletely miscible with water, retaining the droplets of hydrosol for sufficient time to effect substantial gelation, accelerating the rate of gelation by dehydrating by passing a current of a drying gas therethru, separating the resulting catalyst gel particles and drying. 2,505,895. Standard Oil Co., Indiana.

Electrolytic production of elemental fluorine by passing an electric current through an electrolyte between a steel cathode and an anode composed of carbon containing copper, the electrolyte consisting of hydrogen fluoride potassium fluoride and lithium floride. 2,506,438. U.S.A. as represented by the U. S. Atomic Energy Commission.

Mineral composition comprising a physical mixture of preprocessed salt with particles of such pre-processed salt which have a coating of an alkaline iodide and a stabilizer therefor crystallized in situ thereon. 2,506,568. Carey Salt Co.

Preparation of stable solutions containing alkali metal hypochlorite, by adding calcium hypochlorite to a hot aqueous solution containing excess alkali metal carbonate to convert all the calcium to calcium carbonate and separating the latter. 2,506,630. William Robertson Bruce.

Apparatus for producing sulfuric acid by absorbing sulfur trioxide in oleum. 2,506,647. E. I. du Pont de Nemours & Co.

Obtaining cuprous oxide from a mixture of cuprous and cupric oxides by introducing such mixture of oxides into an aqueous reaction medium, introducing an acid of the class consisting of sulfuric and fluoboric acids to form the corresponding cupric salt, and separating the cuprous oxide. 2,507,008. Harshaw Chemical Co.

Making anhydrous hydrogen fluoride by contacting crude HF furnace gas with strong sulfuric acid. 2,507,605. Allied Chemical & Dye Corp.

Producing a quartz crystal comprising, heating fused silica, a crystalline seed of quartz, and an aqueous solution containing an alkaline metasilicate and a water-soluble fluoride crystal growth promoter. 2,508,208. Hazeltine Research, Inc.

Quickly cooling a reactive, hot chlorine and TiO_2-containing gaseous suspension to non-reactive state by directly contacting with a liquid sub-

* From Vol. 633, No. 4; Vol. 634, Nos. 1, 2, 3.

stance selected from the group consisting of chlorine and titanium tetrachloride. 2,508,271. E. I. du Pont de Nemours & Co.

Cooling a suspension of titanium oxide in hot halogen-containing gases by admixing said suspension outside of the reaction zone with an additional quantity of the halogen-containing gases which have previously been cooled and freed of their titanium oxide burden. 2,508,272. E. I. du Pont de Nemours & Co.

Leather *

Solubilizing tanning bark extracts with waste sulfite liquors. 2,505,818. U.S.A. as represented by the Secretary of Agriculture.

Metals *

Producing cobalt metal by treating cobalt oxides with an excess of hydrochloric acid to form cobaltous chloride; neutralizing with dilute ammonia; allowing to stand until precipitation of the impurities has been completed; making a further slight addition of dilute ammonia water and permitting the remaining insolubles, comprising silica, silicates, hydroxides and oxychlorides to precipitate; removing the impurities by filtration; and further adding ammonia to convert the cobalt chloride to the cobalt-chloropentammine in the presence of sufficient ammonium chloride for the formation of the compounds; thereafter oxidizing the cobalt claride in solution by chlorine; thereafter gradually adding hydrochloric acid to effect the precipitation of the pentammine, washing and recovering the metal therefrom. 2,506,159. Reduction and Refining Co.

Smelting sulfide bearing raw materials. 2,506,557. Petri Baldur Bryk and Johan Wilhelm Ryselin.

Electrolytically polishing a metal selected from the group consisting of brasses, bronzes, copper, cobalt, nickel and ferrous metals comprising, making a specimen the anode of an electrolytic cell in which the electrolyte consists of a solution of an alkali metal salt of an acid selected from the group consisting of boric, thiosulfuric and orthophosphoric acids in water, and a completely water miscible organic alcohol. 2,506,582. Edward der Mateosian.

Extracting uranium values and radium values from pitchblende ores by reducing the ores to a comminuted condition, reacting the ore with nitric acid in the presence of an additive from the class consisting of ammonium nitrate and sodium nitrate and a mixture of the two to dissolve the radium values and uranium values. 2,506,945. U.S.A. as represented by the U.S. Atomic Energy Commission.

Beneficating material containing dolomite or magnesite, subjecting the alkalized pulp of said material in the presence of a soluble silicate to the action of at least one anionic collector for oxidized minerals selected from the class consisting of the higher fatty acids, resinous acids, and alkali metal soaps thereof aerating the pulp and removing the magnesium carbonate mineral as a froth concentrate. 2,507,012. Separation Process Co.

Froth flotation of calcite containing dolomite or magnesite subjecting the material in the form of an aqueous pulp in the presence of at least one hydraulic calcium silicate, to the action of at least one anonic active collector selected from the class consisting of the higher fatty acids, resinous acids, and alkali metal soaps, aerating the pulp, and removing the magnesium carbonate mineral as a froth concentrate. 2,507,013. Separation Process Co.

Recovering silver from waste photographic solutions containing recoverable silver and substantial amounts of hydroxy organic acids including tartaric, citric, salicylic, and malic, by adding magnesium sulfate, adding slaked lime to adjust the pH, whereby a magnesium hydroxide floc is formed, permitting the floc to coagulate the solids present in the solution and to precipitate in the form of a sludge from which silver may be obtained by a separation process. 2,507,175. Eastman Kodak Co.

Preparing an aluminum surface for use as a printing surface by treating with a solution containing alkali metal fluoride and non-fluoride alkali metal salt. 2,507,314. Aluminum Co. of America.

Brazing flux consisting of potassium chloride, sodium chloride, lithium chloride and aluminum fluoride. 2,507,346. Aluminum Co. of America.

Protectively coating ferrous and bronze bodies by providing a water solution of ferrous chloride, cobalt chloride and calcium chloride, passing an electric current through the solution to form continuous coatings composed of iron and cobalt. 2,507,400. S. K. Wellman Co.

Electrodeposition of chromium. 2,507,475. Crimora Research & Development Corp.

Electrodeposition of chromium. 2,507,476. Crimora Research & Development Corp.

Organic *

2-amino-2-methyl-4-(3,5 diazacyclohexyl)-4-aza-1-pentanols. 2,504,950. Commercial Solvents Corp.

Acyloxymethyl oxazolines. 2,504,951. Commercial Solvents Corp.

Chloral having its color characteristics substantially unchanged and tendency to polymerize greatly retarded which contain an aliphatic ether. 2,504,952. Food Machinery and Chemical Corp.

Chloral stabilized **polymerization** having dissolved therein a primary aliphatic amine. 2,504,953. Food Machinery and Chemical Corp.

Beta-chloroethyl-dibenzyl-methyl ammonium methosulfate. 2,504,977. Givaudan Corp.

Alkyl ether of 7-hydroxyphenothiazone-3 wherein the alkyl radical contains at least 5 carbon atoms. 2,504,980. U.S.A. as represented by the Secretary of Agriculture.

1-aminomannuronic amide. 2,504,983. U.S.A. as represented by the Secretary of Commerce.

Production of aldohexuronic amide by treating an aminoaldohexuronic amide with acid passing the solution over a cation exchange resin and then over an anion exchange resin, concentrating the effluent and separating aldohexuronic amide. 2,504,984. U.S.A. as represented by the Secretary of Commerce.

Separating a mixture of higher fatty acids into fractions having different melting points comprising rapidly cooling a liquid mixture, contacting the cooled mixture with a solvent and separating the undissolved fatty acid fraction. 2,505,012. Wilson & Co., Inc.

Protein hydrolysis and recovery of glutamic acid. 2,505,129. International Minerals & Chemicals Corp.

Manufacture of a tertiary arylamine by causing a mono-salt of a strong acid of a compound of the formula X-NH-R-Y wherein R stands for an alkylene chain, X for an aryl radical and Y represents a member of the group consisting of the amino group, mono- and dialkylamino and amidino groups, to react with an ester of an acid of the group consisting of hydrohalogen acids and sulfonic acids with an alcohol of the group consisting of aliphatic and araliphatic alcohols. 2,505,133. Ciba Pharmaceutical Products, Inc.

Preparation of an imidazoline by reacting a nitrile with an ethylene diamine in the presence of a catalytic quantity of hydrogen sulfide. 2,505,247. Ciba Pharmaceutical Products, Inc.

Preparation of an imidazoline, by reacting phenyl-benzyl-amino-acetonitrile with ethylene diamine in the presence of a catalytic quantity of Carbon disulfide, as H_2S-yielding agent. 2,505,248. Ciba Pharmaceutical Products, Inc.

Thenoylaminoanthraquinones. 2,505,253. E. I. du Pont de Nemours & Co.

Producing a de-methylated lignin compound by controlled alkaline hydrolysis. 2,505,304. Marathon Corp.

Refining a fatty oil with a solvent which is relatively volatile having a critical temperature not substantially higher than 450°F. 2,505,338. M. W. Kellogg Co.

Preparing substituted piperidones. 2,505,459. Rhom & Haas Co.

Class of compounds consisting of 2-alkylcyclohexylmethylpyridines and 4-alkylcyclohexylmethylpyridines. 2,505,461. Reilly Tar & Chemical Corp.

Alkamine sulfides of quinoline. 2,505,462. Sterling Drug, Inc.

In the catalytic oxidation to a pyridine carboxylic acid of an N-heteroaryl compound the improvement which comprises conducting the oxidation by reacting nitric acid with a concentrated sulfuric acid solution of the N-heteroaryl compound and a substance selected from the group consisting of halogens, hydrogen halides, and halogen-containing compounds which react with sulfuric acid to yield a compound selected from the group of halogens and hydrogen halides, and recovering a compound containing the pyridine carboxylic acid radical. 2,505,568. Allied Chemical & Dye Corp.

4-pyridone-N-carboxylic acids. 2,505,634. Sterling Drug, Inc.

α,β-diphenyl-β-hydroxyethylamine wherein the β-phenyl nucleus contains one to two hydroxyl groups, and salts thereof. 2,505,645. Winthrop-Stearns, Inc.

Oxidizing an ester of a 3-hydroxy-Δ^5-sterol to the 7-oxo derivative with a metal chromate in a medium of the class consisting of acetic acid of at least 80% concentration, acetic anhydride and mixture of the same, and with the addition of oxygen to the reaction mass. 2,505,646. E. I. du Pont de Nemours & Co.

Amides of α:β-unsaturated carboxylic acids. 2,505,682. J. R. Geigy A. G.

Purification of glycerine by forming crude glycerine hydrogen and material of the class consisting of the sulfates of zinc and iron, neutralizing the resulting mixture and then filtering off the solids and distilling the filtrate. 2,505,735. Harshaw Chemical Co.

Treating the product of hydrogenation of oxides of carbon which comprises cooling to effect condensation to an oil product liquid phase and a water product liquid phase, separating said phases, separating acids from non-acidic compounds in said water product to produce a mixture comprising aldehydes and other non-acidic organic compounds, separating aldehydes not higher boiling than propionaldehyde, and subjecting said oil product liquid phase to extraction with the remainder of said last-mentioned mixture to obtain a raffinate comprising hydrocarbons and an extract comprising oxygenated organic compounds. 2,505,752. M. W. Kellogg Co.

A 3-alkyloxyphenothiazine wherein the alkyl radical contains at least 8 carbon atoms. 2,505,772. U.S.A. as represented by the Secretary of Agriculture.

Production of cyclohexane free of benzene from a hydrocarbon mixture comprising a methylcyclopentane in admixture with open chain hexanes of normal and branched structure by fractionating said mixture to separate a higher boiling fraction methylcyclopentane in admixture with benzene and a lower boiling fraction comprising branched chain hexanes, contacting said higher boiling fraction with an isomerization catalyst catalyzing the reaction to cyclohexane, contacting branched chain hexane fraction with an isomerization catalyst to isohexane. 2,505,792. Shell Development Co.

4,6-di-tertiary-butyl-2-methylcyclohexanone. 2,505,816. Gulf Research & Development Co.

Hydrogenated polyalkylated phenols. 2,505,817. Gulf Research & Development Co.

4-bromo-3,11-diketo-17(a)-hydroxy-20-acyloxypregnanes. 2,505,837. Merck & Co., Inc.

11-ketopregnenes. 2,505,838. Merck & Co., Inc.

New composition of matter selected from the group consisting of N-piperidino-tert-butyl-thiol, N-heptylamino-tert-butylthiol, N-beta-pipecolino-tert-butylthiol, di-n-heptylamino-tert-butylthiol, N-(4-ethylpiperidino)-tert-butylthiol, 2-(N-piperidino)cyclohexylthiol, and N,N,-bis(2-methyl-2-thiolpropyl)-piperazine. 2,505,870. Phillips Petroleum Co.

Fluorizing an organic compound in **vapor phase** by elemental fluorine by separately introducing the organic compound in vapor phase and elemental fluorine into a permeable body of a fluorination catalyst which consists of copper particles having a silver fluoride coating. 2,505,877. U.S.A. as represented by the U.S. Atomic Energy Commission.

Production of a sulfonic acid, by contacting a saturated hydrocarbon thiol wherein the sulfhydryl group is linked to a non-tertiary carbon atom with a gas containing free oxygen and a catalytic quantity of a nitrogen oxide in the presence of water. 2,505,910. Standard Oil Co., Indiana.

Pyridinium esters. 2,505,948. Petrolite Corp., Ltd.

Preparing 4-(ortho-carboxy-phenylamino)-4'-amino diphenyl sulphide by reacting an orthohalogenobenzoic acid with a 4-amino-4'-carboxyacylamidodiphenyl sulphide in the presence of an acid acceptor and metallic copper, separating the resulting 4-(orthocarboxyphenylamino)-4'-Carboxy-acylamidophenylsulphide and hydrolysing the carboxyacylamide group. 2,506,019. Ward, Blenkinsop & Co. Ltd.

1-acylamino-4-[(N-dialkylamino) - sulfonamido - benzoylamino] - anthraquinones. 2,506,023. Ciba, Ltd.

1-benzoylamino-4-(3' sulfonamido)-benzoylamino-anthraquinones. 2,506,024. Ciba, Ltd.

Cyanotricarboxylate compounds. 2,506,050. General Mills, Inc.

Production of fluoroacetic acids by reacting afluoroethylenic compound with an aqueous metal per manganate solution, in the presence of a basic compound from the group consisting of calcium and magnesium oxide and hydroxide sufficient to combine with all the acids liberated during the reaction. 2,506,068. Imperial Chemical Industries, Ltd.

Adrenochrome mono-semicarbazone compound. 2,506,294. Societe Belge de l'Azote et des Produits Chimiques du Marly.

Preparing 2-meta aminobenzenesulfonamido-5-halopyrimidines by mixing together and reacting a meta-nitro-benzenesul'fonyl halide with 2-aminopyrimidine in the presence of a tertiary amine, treating the reaction product with a halogen, and reducing the meta-nitro group to an amino-group. 2,506,351. American Cyanamid Co.

Production of the higher fatty acid esters of poly-chlorinated phenols by reacting chlorine with phenol in solution in higher fatty acid and adding phosphorus oxychloride to the reaction mass. 2,506,361. Eric Berkeley Higgins.

Making a methyl germanium compound by mixing a methyl germanium halide with water, passing hydrogen sulfide into the water mixture, and isolating the insoluble methyl germanium sulfide. 2,506,386. General Electric Co.

* From Vol. 633, No. 4; Vol. 634, Nos. 1, 2, 3.

Making a thiophenol by heating a mixture of a di-aryl polysulfide and a petroleum hydrocarbon. 2,506,416. Allied Chemical & Dye Corp.

Organic sulfonates obtained in the form of the free acid by reaction of acetaldehyde disulfonic acid with an alkyl benzene in the presence of an aldehyde condensation type of condensing agent. 2,506,417. Allied Chemical & Dye Corp.

Making a highly chlorinated hydrocarbon of the molecular formula C_6HCl_{12} by condensing an octachloropentatriene obtained by the condensation of hexachloropropene with trichloroethene in the presence of anhydrous aluminum chloride. 2,506,428. U.S.A. as represented by the U.S. Atomic Energy Commission.

Dehalogenating a halogenated sterol compound which has been subjected to oxidation wherein the dehalogenation of the oxidized halogenated sterol compound is accomplished by reacting the oxidized halogenated sterol compound with zinc in the presence of a short chain fatty acid. 2,506,457. Nopco Chemical Co.

Production of arecoline. 2,506,458. Nopco Chemical Co.

Recovering high boiling fatty alcohols containing 8 to 20 carbon atoms from their esters by saponifying with an alkaline agent in the presence of a water-miscible solvent which is a solvent for the fatty alcohols and soap formed by the saponification and then distilling to obtain a codistillate containing such solvent and the fatty alcohols. 2,506,473. Richards Chemical Works.

2-carboxylalkylthiophane-3,4-dicarboxylic acid. 2,506,536. American Cyanamid Co.

Vanillin purification by distillation. 2,506,540. Monsanto Chemical Co.

Alkylation of benzene with an alkyl chloride containing at least 2 carbon atoms by contacting benzene with said alkyl chloride, in the absence of catalytic material, at 400°F. and 700°F. at a pressure of 200 pounds per square inch. 2,506,551. Socony-Vacuum Oil Co., Inc.

Acetals from acrylonitrile, carbon monoxide, hydrogen, and alcohols. 2,506,571. E. I. du Pont de Nemours & Co.

N - (2 - hydroxyethyl) - 1,2-bis(4 - methoxyphenyl) - ethylamine. 2,506,588. George A. Breen & Co.

Derivatives of dl-hexahydro-2-oxo-4-(4-haloalkyl)-1-furo-(3,4)-imidazole. 2,506,594. Ciba Pharmaceutical Products, Inc.

1-alkyl-4-hydroxy-piperidine esters of alkyl substituted acetic acids. 2,506,-605. J. R. Geigy, A. G.

Thermal chlorinolysis and brominolysis of fluorocarbons to produce fluorocarbon chlorides and bromides. 2,506,652. Minnesota Mining & Manufacturing Co.

4-N-acylamino-1-phenyl-2:3-dimethyl-pyrazolone derivatives. 2,506,654. Teva Chemical Mfg. Co.

Beta-benzyl amine salt of alpha-methyl-d-alpha benzylpencilloate. 2,506,696. E. R. Squibb & Sons.

Aminopurine lactates. 2,506,786. Burroughs Wellcome & Co. (U.S.A.) Inc.

Azeotropic distillation of hydrocarbons with tetrahydrofuran 2,506,858. Phillips Petroleum Co.

Synthetic wax comprising a neutral higher fatty monocarboxylic acid ester of a fusible, soluble monoalkylated phenol-formaldehyde condensation product. 2,506,903. Gulf Oil Corp.

Synthetic wax comprising a neutral condensation product of formaldehyde and a higher fatty monocarboxylic acid ester of a mono-alkylated phenol. 2,506,904. Gulf Oil Corp.

Sulfosuccinate esters of 4-alkylphenoxyethanols. 2,507,030. American Cyanamid Co.

Recovering acetophenone from the crude product containing the same with genetic impurities formed with acetophenone by the liquid phase oxidation of ethylbenzene by means of an oxygen gas, by fractionally distilling said crude oxidation product and recovering that fraction containing acetophenone. 2,507,048. Allied Chemical & Dye Corp.

In sulfoxidation of a saturated hydrocarbon aliphatic in character by means of sulfur dioxide and oxygen, the improvement wherein the sulfoxidation is conducted in the presence of a Ph^{IV} salt of a saturated aliphatic monocarboxylic acid of 2 to 4 carbons. 2,507,088. E. I. du Pont de Nemours & Co.

Preparation of paraquinone dioxime by forming a solution containing a hydroxylammonium salt and nitrosophenol, heating to effect reaction of said salt with the nitrosophenol, and recovering para-quinone dioxime. 2,507,112. Standard Oil Development Co.

Aryl azo methine sulfonic acids. 2,507,114. E. I. du Pont de Nemours & Co.

Making 3-halo-2-methylquinoline by reacting a compound selected from the group consisting of aniline, o-toluidine, m-toluidine, p-toluidine, o-anisidine, m-anisidine, p-anisidine, o-nitroaniline, m-nitroaniline, p-nitroaniline, 2-methoxy-5-methylaniline and a mono halogen aniline compound containing no substituents other than the amino group and the halogen atom with a compound selected from the group consisting of α-chloro crotonaldehyde α-chloro-β-hydroxy-n-butyraldehyde, α-bromo-β-hydroxy-n-butyraldehyde and α-bromo crotonaldehyde in the presence of a mineral acid and an oxidizing agent. 2,507,146. Eastman Kodak Co.

Producing acetylene black by subjecting a hydrocarbon gas containing methane to its dissociation temperature to produce a mixed gas containing acetylene; passing to a precipitating chamber; subjecting said mixed gas to an electrostatic field to produce acetylene black. 2,507,157. Tennessee Eastman Corp.

Alkali-refining of fatty glycerides in the presence of an inorganicphosphate compound. 2,507,184. Lever Brothers Co.

Manufacture of N-methyl-para-aminophenol by passing hydrogen into a solution of a member of the class consisting of methylene-para-aminophenol and formaldehyde and para-aminophenol in a methyl alcoholic medium which contains a nickel catalyst and a member of the class consisting of caustic alkalies and their methoxides. 2,507,192. Societe des Usines Chimiques Rhone-Poulenc.

Product obtained by chlorinating an adduct resulting from the addition of two mols of cyclopentadiene to one mol of benzoquinone dissolved in carbon tetrachloride. 2,507,208. Julius Hyman.

5,8-bis(diethylaminomethyl) quinoline. 2,507,313. National Drug Co.

1,5-dialkyl tetrazoles. 2,507,327. E. Bilhuber, Inc.

Making thiophosphates by subjecting a monoaryl monothiophosphoric acid dihalide to the action of an alkanol to form a monoaryl dialkyl monothiophosphate. 2,506,344. Plant Products Corp.

1-alkylsulfonyl-4-alkyl piperazines. 2,507,408. Societe des Usines Chimiques Rhone-Poulenc.

1-alkyl-4-hydroxypiperidine esters. 2,507,449. J. R. Geigy A. G.

Monobasic phospate salt of 1-phenyl-2-amino-propane. 2,507,468. Clark & Clark Co.

Thiocyanated reaction product obtained upon causing ethylene chlorohydrin to interact with 4-vinyl cyclohexane and then treating the product thus obtained with an alkali metal thiocyanate in presence of metallic copper catalyst. 2,507,471. Sun Oil Co.

Thiocyanoacetate derived from 4-vinyl-cyclohexene by esterifying 4-vinyl-cyclohexene with monochloroacetic acid, said esterification being effected in the presence of an acid type catalyst, reacting the ester product with an alkali metal thiocyanate at an elevated temperature in the presence of a solvent, and separating the product. 2,507,472. Sun Oil Co.

Coumaran derivatives. 2,507,473. Smith, Kline & French Labs.

Preparation of N-aryl-2,4-diketo-tetrahydroquinolines. 2,507,485. General Aniline & Film Corp.

Oxygen carrier for the oxidation of a normally gaseous hydrocarbon consisting of a mixture containing titania and oxides of iron, chromium, and nickel. 2,507,502. Standard Oil Development Co.

Hydrolyzing a halogenated aromatic hydrocarbon having, attached to a carbon atom of the aromatic nucleus, an alpha-halo-alkyl radical to remove the alpha-halogen and form a corresponding alcohol, heating the crude alcohol with boric acid to distill from the mixture non-alcoholic impurities. 2,507,506. Dow Chemical Co.

Preparing a trialkyl trimesate by heating an alkyl beta-alkoxy-acrylate, in which the alkyl groups are nontertiary and contain 1 to 4 carbon atoms with a strongly basic quaternary ammonium alcoholate in which the alcoholate group is derived from an aliphatic monohydric alcohol of less than four carbon atoms. 2,507,509. Rohm & Haas Co.

Production of hexaorgano-disilapropanes by reacting a compound of the type R_3SiX, in which X is chlorine or bromine, with a compound of the type R_3SiCH_2X by contacting the latter in liquid phase with an alkali metal in the presence of the former compound in liquid phase. 2,507,513. Dow Corning Corp.

2,4-dimethyl-2,4-trimethylsilylphenyl-2,4-disilapentane. 2,507,514. Dow Corning Corp.

Bis-trihydrocarbon silylphenyl silanes. 2,507,515. Dow Corning Corp.

Organosiloxanes. 2,507,516. Dow Corning Corp.

Trifunctional disilmethylene compounds and hydrolysis products. 2,507,517. Dow Corning Corp.

Halogenosilahydrocarbons. 2,507,518. Dow Corning Corp.

Difunctional silahydrocarbons. 2,507,520. Dow Corning Corp.

Acting upon ethyl naphthalene with oxygen in the presence of an oxidation catalyst to obtain a mixture of methyl naphthyl carbinol and methyl naphthyl ketone and acting upon said mixture with hydrogen in the presence of a cupric chromite. 2,507,527. Koppers Co., Inc.

Arsenic sulfathiazole chelate complex. 2,507,537. Chicago Pharmacal Co.

Preparing hydrogen-nitroxylene mixture for production of xylidine. 2,507,-539. Allied Chemical & Dye Corp.

Producing myrcene from beta-pinene. 2,507,546. U.S.A. as represented by the Secretary of Agriculture.

$[(CH_2)_2SiCH_2]_4Si$ 2,507,551 Dow Corning Corp.

Telomers of monoolefins and saturated halogenated carboxylic acids, esters, and anhydrides. 2,507,568. E. I. du Pont de Nemours & Co.

Pyridine and piperidine compounds. 2,507,631. Ciba Pharmaceutical Products, Inc.

Preparing an aldehyde by reacting an α,β-unsaturated alcohol, a primary amine characterized by having an amino group joined directly to an aromatic nucleus, and a ketone, in the presence of a member selected from the group consisting of aluminum alkoxide and magnesium alkoxide and thereby forming an azo-methine reaction product hydrolyzable to the corresponding α,β-unsaturated aldehyde. 2,507,647. Eastman Kodak Co.

N,N',N''-triacylmelamines. 2,507,700. Monsanto Chemical Co.

Reacting phosphorus sulfide and olefinic hydrocarbon. 2,507,731. Standard Oil Co., Indiana.

Alkylation of aniline. 2,507,755. Phillips Petroleum Co.

Production of alkyl benzenes catalytically from benzene and olefin-bearing material. 2,507,765. Phillips Petroleum Co.

Production of alkyl benzenes catalytically from benzene and olefin-bearing material. 2,507,766. Phillips Petroleum Co.

Alkyl-sulfonic acid salts of dihydro-ergocornine. 2,507,829. Sandoz Ltd.

Methane sulfonic acid salt of dihydro-ergotamine. 2,507,830. Sandoz Ltd.

Alkyl-sulfonic acid salts of dihydro-ergocryptine. 2,507,831. Sandoz Ltd.

Water-soluble salts of dihydro-ergocristine. 2,507,832. Sandoz Ltd.

Alkylsulfonic acid salts of dihydroergosine. 2,507,833. Sandoz Ltd.

Nicotinium alkyl sulfates. 2,507,925. J. B. Niederl & Associates, Inc.

Electrolytic reduction of sugars to polyhydric alcohols. 2,507,973. Hans Rudolf Hefti and Werner Kolb.

Preparation of alcoholic thioethers by heating a polymer having the general formula R_3-[S-$(CH_2)_2$-O-$(CH_2)_2$]$_n$-R_3 in which n is an integer greater than one and R_1 represents a substituent selected from the group consisting of the hydrogen atom and the radical $(CH_2)_2$-O-CH=CH_2 and R_2 represents a substituent selected from the group consisting of the sulfhydryl radical and the radical -S$(CH_2)_2$-O-CH=CH_2 to produce 1,4-thioxane. 2,508,005. Shell Development Co.

Preparing aromatic dicarboxylic acids by cutting metallic magnesium to expose continuously fresh surface areas to an anhydrous solution of an arylene dichloride to form the arylene-bis(magnesium chloride) derivative, contacting said derivative with carbon dioxide, and separating the resulting dicarboxylic acid. 2,508,022. Monsanto Chemical Co.

Pentachloro-2,4-cyclopentadienylidene-1-acetic acid, pentachloro-2,4-cyclopentadienylidene-1-acetyl chloride, pentachloro-2,4-cyclopentadienylidene-1-acetates, and pentachloro-2,4-cyclopentadienylidene-1-acetamides. 2,-508,182. Purdue Research Foundation.

Contacting a gas mixture containing ethylidene fluoride and methyl chloride with a non-aromatic liquid petroleum hydrocarbon oil to extract methyl chloride from said gas mixture and form an off-gas enriched in ethylidene fluoride. 2,508,221. Allied Chemical & Dye Corp.

Production of polar-substituted organic peroxides. 2,508,256. Shell Development Co.

Preparing the dimethyl acetal of propargyl aldehyde by heating a mixture of the dimethyl acetal of alpha-chloroacrolein with an aqueous solution of sodium hydroxide and distilling the dimethyl acetal of propargyl aldehyde. 2,508,257. Shell Development Co.

Producing acrylamide by heating hydracrylamide in the presence of an anhydrous sodium carbonate to distill off a quantity of acrylamide. 2,508,279. American Cynamid Co.

Separation of 4-(4',-cyano-4',4'-diphenyl-butyl-2')morpholine from its isomer by forming a mixture of salts of solid isomers with an acid selected from the class which consists of hydrochloric acid, hydrobromic acid, 2,5-dichlorobenzenesulfonic acid, m-nitrobenzenesulfonic acid and p-chlorobenzenesulfonic acid, fractionally crystallizing said mixture, separating the corresponding salt of the desired isomer from said mixture and decomposing said salt by treatment with an aqueous alkaline solution to obtain said 4-(4',-cyano-4', 4'-diphenyl-butyl-2')-morpholine. 2,508,322. Merck & Co., Inc.

Triazine derivatives. 2,508,323. American Cyanamid Co.

β-phenyl-β-pyridyl and β-phenyl-β-piperidyl ethyl amines. 2,508,332. Ciba Pharmaceutical Products, Inc.

2,4,5-trichlorophenol esters. 2,508,334. Dow Chemical Co.

Petroleum *

Improved mineral oil composition comprising mineral oil and, to stabilize the oil against oxidation, an oil-soluble compound selected from the group consisting of alkyl, alkaryl, aralkyl, and ary selenorophosphates. 2,506,049. Battelle Memorial Institute.

* From Vol. 633, No. 4; Vol. 634, Nos. 1, 2, 3.

Equipment Company Addresses

(Continued from page 290)

National Carbon Div., Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
National Drying Machinery Co., Hancock St. & Lehigh Ave., Philadelphia 33, Pa.
Niagara Filter Corp., Buffalo, N. Y.
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Pittsburgh Lectrodryer Corp., P. O. Box 1766, Pittsburgh 30, Pa.
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NEWS OF THE MONTH——

• **Although the upward trend** of materials and equipment prices, labor and freight rates continues, the Austin Co. reports that it is able to hold the line on building costs by resourcefulness in design and construction. The company is using more and larger mechanized equipment and a steadily growing percentage of prefabricated materials and factory-built equipment to stretch manpower. Such steps as designing construction scaffolding and form work with a view to using these materials in the building itself are indicative of the attention to close planning that must be given today.

• **General offices and plant** of the Industrial Filter & Pump Manufacturing Co. have been moved from 1621 West Carroll Avenue to a newly acquired location at 5900 Ogden Ave., Chicago, Ill.

• **A three-year working agreement** with The Dow Chemical Co.'s Midland, Mich., Div., containing a 24½ cent economic package was recently approved by members of Local 12075, UMWA. Principal points of the new contract provide for three automatic 5-cent hourly increases and continuation of the cost-of-living bonus set up two years ago, but with a lower base.

• **Thirty-one American libraries** throughout the country have been named as official depositories for complete sets of atomic energy declassified and unclassified research reports. There are at present approximately 3,500 reports in a full set and about 1,500 new reports are issued every year. Each library will have a full set of documents and a catalog card index to assist the public in using the documents effectively.

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Dyes

(Continued from page 197)

benzidine; (5) bis-diamino-(aminophenyl) urea; (6) diaminobibenzyl; (7) phenylbenzothiazole; (8) benzocoumarin; and (9) tris(aminophenyl-ethylene. These classes have diverse properties. The most important characteristics are absorption in the ultraviolet, fluorescence in the visible, water solubility or dispersibility, fiber substantivity, and certain stability requirements such as hypochlorite resistance.

Some of the most important color and application characteristics are strength, shade, build-up, equilibrium exhaustion, and leveling exhaustion.

Although research activity has centered largely on those optical bleaches for use on cotton, considerable attention is being devoted to those for other uses. β-Methylumbelliferone, which has no affinity for textile fibers, has been widely used to whiten soap.

Brighteners with affinity for wool are now used in conjunction with peroxide bleaches. Use on paper is increasing. They are coming into prominence to produce white backgrounds in textile printing. For "invisible" laundry marks on both wool and silk, we find increasing use. It would not be surprising to find them used to whiten gray hair.

It appears safe to say that the patent literature in the future will reflect the present activity in this field. Three patents—one on a product of the stilbene class and two for benzimidazoles—were among those granted last year.

NEW APPLICATION METHODS

The Thermosol process *(12)* for dyeing and printing Fiber V, Orlon and nylon consists of padding or printing a solution or dispersion of selected dyes, then drying and heating for a short time (5 to 60 seconds) at a relatively high temperature (360 to 480° F.). The color appears to dissolve in the fiber and subsequent soaping and washing remove the unfixed color.

The highly publicized Vat Craft *(13)* process offers much but as far as can be determined is not yet a complete commercial success. Uniform level dyeings of viscose and acetates are obtained and the latter are said to be unsaponified. There are four steps in the process. The first takes the fabric through a dye solution which contains the uranium compound, UA-1. Next the fabric is immersed in a photo-sensitizing solution which leaves the fabric coated much in the manner of an undeveloped camera film. The third step is passage through a light radiation chamber, used commercially for the first time, which develops and fixes the color. This chamber is 15 ft. high and contains two rows of vertical lights producing a total of 112,500 watts and a temperature of 90-100° C. The final step is a fresh water wash, drying and finishing.

The Calcotherm process *(14)* comprises the stabilization of the leuco compounds of vat dyes at high temperatures where normally these leuco compounds would be destroyed. Thus, particularly in package and continuous dyeing, greater speed, better penetration and better uniformity is obtained.

In addition, in the mills we find the installation of more and more continuous dyeing equipment.

RESIN BONDED PIGMENTS

There is little change technically in the manufacture of resin bonded pigments. The four systems for the application of these colors are the same: namely, the aqueous dispersion, the solvent dispersion, the water-in-oil emulsion system and the oil-in-water emulsion system.

Commercially, there appears to be a distinct trend in the trade that constitutes a change. Formerly resin bonded pigments were sold as color bases and clears. Now printers are buying resins and making their own clears. Some are even investigating the making of their own color bases. Thus, by buying the ingredients and by making his own mixes the printer saves on the freight charges of the individual ingredients.

There are not many new products. A straight direct brown for acetate rayon, a new red for acetates of excellent light fastness, and a new pure yellow for vats about completes the picture. There was a re-introduction of a line of old vat dyes for wool which are claimed to dye wool without decreasing its fiber elasticity or strength and to be better than chrome colors.

REFERENCES

1. Harrogate Symposium, *J. Soc. Dyers & Colourists 65*, 585 (1949).
2. Kuhn, W., *J. Chem. Phys. 17*, 1198 (1949)
3. Alexander, P., *Canadian Textile Jour.*, Jan. 20, 1950, 49-55; *et al, Textile Res. J.* 20, 203 (1950).
4. Lipson, M., and Speakman, J. B., *J. Soc. Dyers & Colourists, 65*, 390 (1949).
5(a). Capp, C. W., and Speakman, J. B., *op. cit.*, 402 (1949).
5. Farnsworth, A. J., and Speakman, J. B., *op. cit.*, 447 (1949).
6 Knight, A. H., *ibid, 66*, 34 (1950).
7. Knight, A. H., *op. cit.*, 169 (1950).
8. Mellon, M. G., editor, "Analytical Absorption Spectroscopy," 1950, John Wiley & Sons, Inc.
9 Wiswall, R. H., Jr., U.S.P. 2,486,351. Loukomsky, S. A., U.S.P. 2,486,304.
10. Stearns, E. I., *et al, Soap and Sanitary Chemicals 26*, 37-40 (1950).
11. Stearns, E. I., *et al. op. cit.*, 48-49, 143 (1950).
12. *Technical Bull. 5*, 82 (1949).
13 *Journal of Commerce*, Nov. 2, 1949.
14. *Dyelines and Bylines*, June, 1950.

News of the Month

(Continued from page 335)

pointed manager of the Rensselaer dyestuff plant of **General Aniline & Film Corp.** He succeeds William L. Walsh, who recently was named assistant to the general manager of the entire dyestuff division of the company.

Sales

• Meredith (Ted) Littlefield, sales coordinator in charge of the San Francisco Office, has been appointed manager of the western sales region of **Ethyl Corp.**

Research

• E. N. Rosenquist has been named assistant director of the Central Research Department of **Monsanto Chemical Co.**

• **Evans Research and Development Corp.**, New York, has appointed Kurt S. Konigsbacher to its staff as a project group leader.

INDEX *of* ADVERTISERS

Aaron Equipment Co. 350
Aceto Chemical Co. 338
Allied Asphalt & Mineral Corp. 334
Allied Steel & Equipment Co. 349
American-British Chemicals Supplies, Inc. 251
American Can Co. 307
Anderson Physical Lab. 353
Ansul Chemical Co. 296
Antara Products Div., General Aniline & Film Corp. 235, 253
Aries & Associates, R. S. 353
Arkell & Smiths 204
Armour & Co., Chemical Div. 221
Arnold-Hoffman & Co., Inc. 230
Atlas Powder Co. 243

Baker & Adamson Products, General Chemical Div., Allied Chemical & Dye Corp. 273
Baker Chemical Co., J. T. 261
Barrett Div., Allied Chemical & Dye Corp. 160, 316, 356
Bjorksten Research Laboratories 353
Brill Equipment Co. 349
Buckeye Cooperage Co. 349
Burke, Edw. S. 333

Calkin, John B. 354
Calvert, Robert 353
Carbide & Carbon Chemicals Div., Union Carbide & Carbon Corp. 170
Cargille, R. P. 348
Celanese Corp. of America 223
Chemical Construction Corp. 301
Chemical Service Corp. 352
Church & Dwight, Inc. 328
Claffin, Alan A. 349
Clark Microanalytical Lab. 353
Colburn Laboratories, Inc. 353
Commercial Solvents Corp. 176
Consolidated Chemical Industries, Inc. 333
Consolidated Products Co., Inc. 351
Continental Can Co. 309
Cowles Chemical Co. 241
C. P. Chemical Solvents, Inc. 349
Croll-Reynolds Co. 300
Crosby Chemicals, Inc. 334

Davison Chemical Corp. 289
Diamond Match Co. 350
Diehl & Co., William 336
Dodge & Olcott, Inc. 226
Doe & Ingalls, Inc. 349
Dow Chemical Co. 162, 255
Du Pont de Nemours & Co., E. I. 164, 165, 335

Eastman Kodak Co. 331
Edcan Laboratories 270
Eimer & Amend 313
Emery Industries, Inc. 225
Esso Standard Oil Co. 329
Evans Research & Development Corp. 353

Fairmount Chemical Co., Inc. 263
Ferguson Co., H. K. 222
Fine Organics, Inc. 348
First Machinery Corp. 350
Fisher Chemical Co. 320
Fisher Scientific Co. Food Research 313
Food Research Laboratories, Inc. 353
Foote Mineral Co. 310
Freeport Sulphur Co. 237
Fritzsche Brothers, Inc. 294

General American Transportation Corp. 337
General Ceramics & Steatite Corp. 330
General Chemical Div., Allied Chem. & Dye Corp. Inside Back Cover
General Magnesite & Magnesia Co. 242
Glycerine Producers Association 233
Gravelle Lab., The 353
Greeff & Co., R. W. 330
Greiner Co., Emil 312
Gross & Co., A. 267

Hardesty Chemical Co., Inc. 157
Hardesty Co., W. C. 209
Harshaw Chemical Co., The 295
Hercules Powder Co. 219
Heyden Chemical Corp. 231
Hooker Electrochemical Co. 211
Humphrey-Wilkinson, Inc. 271

International Paper Co., Bagpak Div. 168, 169

Jacobs, Albert L. 353
Jasper Machinery Co., Inc. 350

Kay-Fries Chemicals, Inc. 251
Kessler Chemical Co., Inc. 319
Killeffer, D. H. 353
Koppers Co., Inc. 173
Kraft Foods Co. 249

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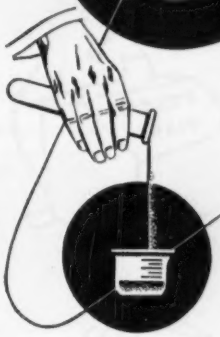

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INDEX *of* ADVERTISERS

Lamex Chemical Corp. 311
Lohse, Henry W. 353
Lucidol Div., Novadel-Agene Corp. 334

Machinery & Equipment Corp. 350
Mallinckrodt Chemical Works 269
Mann & Co., George 349
Marine Magnesium Products Corp. 333
Mathieson Chemical Corp. 156
McCutcheon, John W. 338, 354
McKesson & Robbins, Inc. 228
Metal Textile Corp. 224
Metalloy Corp. 220
Molnar Laboratories 353
Monsanto Chemical Co. 166, 167
Mutual Chemical Co. of America 159

National Aniline Div., Allied Chem. & Dye Corp. 161
National Chemical Exposition 339
National Distillers Chemical Corp. 247
Natural Products Refining Co. 174
Niacet Chemical Div.; United Vanadium Corp. 306
Niagara Blower Co. 308
North American Car Corp. 285

Oldbury Electro-Chemical Co. 320
Olin Laboratories, R. H. 353
Onyx Oil & Chemical Co. 321
Oronite Chemical Co. 239

Pacific Coast Borax Co. 311
Panray Corp., The 354
Patterson-Kelley Co., Inc. 303
Perry Equipment Corp. 349
Peters Chemical Co. 349
Pfizer & Co., Inc., Charles 212
Phelps Dodge Rfg. Corp. 332
Phoenix Pabst-ett Co. 249
Pittsburgh Coke & Chemical Co. 163
Powell Co., Wm. 299
Precision Thermometer & Instrument Co. 210
Pressed Steel Tank Co. 291
Proctor & Schwartz, Inc. 281

Raymond Bag Corp. 343
Reichhold Chemicals, Inc. 244
Rosenthal Bercow Co., Inc. 333

St. Regis Paper Co. 305
Sauereisen Cements Corp. 349
Schrutchfield, Paul H. 353
Seil, Putt & Rusby, Inc. 353
Sharples Chemical, Inc. 297
Shell Chemical Corp. 229
Sindar Corp. 314
Snell, Inc., Foster D. 218, 353
Solvay Sales Div., Allied Chem. & Dye Corp. ..... Inside Front Cover
Sperry & Co., D. R. 325
Starkweather Co., Inc., J. U. 349
Stauffer Chemical Co. 227
Superior Air Products Co. 350

Tennant, Sons & Co., C. 330
Tennessee Corp. 355
Tennessee Eastman Corp. 265
Tennessee Products & Chemical Corp. 317
Texas Gulf Sulphur Co. 315
Titanium Alloy Mfg. Co. 322
Titlestad Corp., Nicolay 234
Tomsett Associates 352
Truland Chemical & Engineering Co., Inc. 352

Udy, Marvin J. 353
Ultra Chemical Works 207
Union Carbide & Carbon Corp., Carbide & Carbon Chemicals Div. 170
Union Standard Equipment Co. 352
U. S. I. Chemicals, Inc. ..... between 162 & 163
U. S. Potash Co., Inc. 348
United States Steel Corp., Coal Chemical Sales Div. 326

Vanderbilt Co., Inc., R. T. 319
Victor Chemical Works 203
Virginia-Carolina Chemical Corp. 293
Virginia Smelting Corp. 318
Visking Corp., The 277

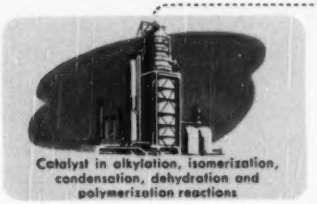
Welch, Holme, & Clark 158
Wellworth Trading Co. 349
Westvaco Chemical Div., Food Machinery & Chem. Corp. 155
Witco Chemical Co. ..... Back Cover
Wyandotte Chemicals Corp. 259

York Co., Otto B. 302

PERIODICAL PRESS CORP., PHILA., PA.

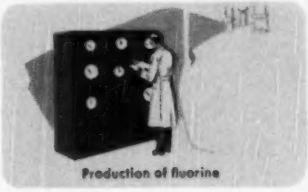
Anhydrous Hydrofluoric Acid

USES OF ANHYDROUS HYDROFLUORIC ACID



Catalyst in alkylation, isomerization, condensation, dehydration and polymerization reactions

Fluorinating agent in organic and inorganic reactions

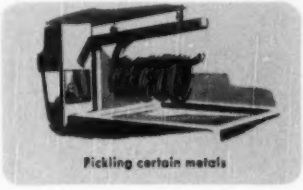


Production of fluorine

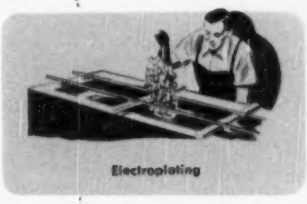
Hydrofluoric Acid (AQUEOUS)

USES OF AQUEOUS HYDROFLUORIC ACID

Polishing, etching, frosting glass



Pickling certain metals



Electroplating

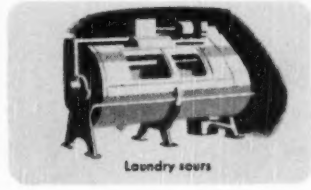
—2 VERSATILE CHEMICALS FOR AMERICAN INDUSTRY

Cleaning stone, brick

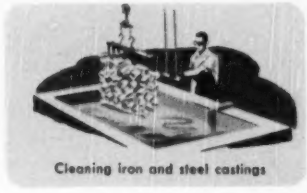
In breweries to control fermentation

For dissolving ores; ore flotation

BY *GENERAL CHEMICAL* . . . First in Fluorides



Laundry sours



Cleaning iron and steel castings

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Asphaltic Mastics
Driers
Stearates
Miscellaneous chemicals

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Carbon Black

LAWRENCEVILLE, ILL.
Asphalt

PERTH AMBOY, N. J.
Asphalt

SUNRAY, TEXAS
Carbon Black

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